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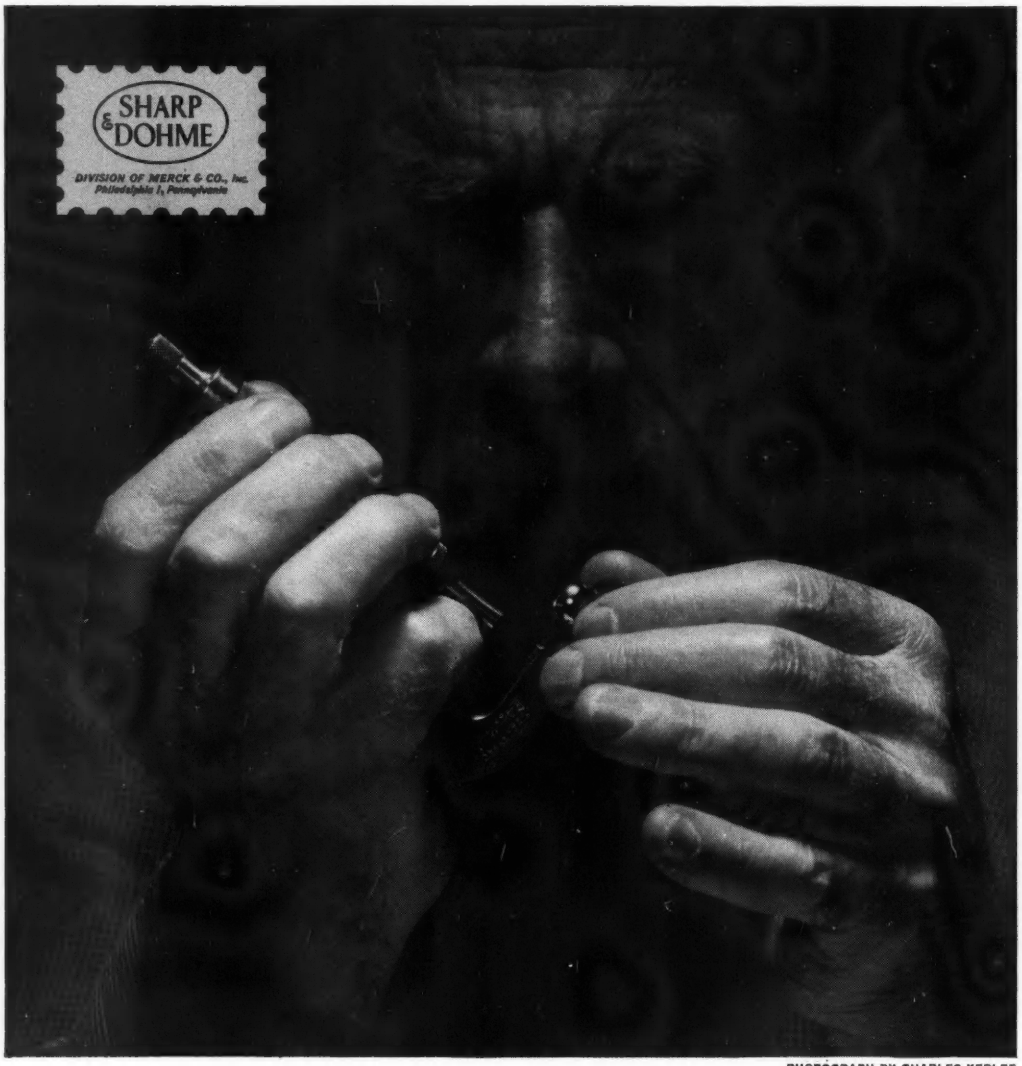

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*From a case report: J.A.M.A. 153:191, 1953.

California MEDICINE

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Present Status of Serological Tests for Cancer

JUSTIN J. STEIN, M.D., Los Angeles

In 1900 the average life expectancy for persons in the United States was 49 years; today it is approximately 69 years. In 1900 cancer was eighth among the principal causes of death in this country, with 64 deaths per 100,000 population. In 1946 it was the second most common cause of death and the crude mortality rate was 130 per 100,000 population.

More than 90 per cent of cancer cases occur in persons over 30 years of age and the continued increase in the longevity of the population accounts for the major portion of the increase in cancer mortality. Of 211,090 persons who died of cancer and other malignant tumors in 1950, 106,015 or more than half were under 65 years of age, 23.647 or about 11 per cent were under 45 years and 5,466 or about 2.5 per cent were under 25 years of age.[16] Improved diagnostic methods have also helped to list the correct cause of death which in the past may have been improperly diagnosed. Also, autopsy is done more often nowadays. For example, many deaths attributed to pneumonia were probably caused by pulmonary cancer and deaths ascribed to gastric ulcers may have been caused by cancer of the stomach.

From studies reported by Dorn[4,5,6] in 1944 of the number of cancer cases in ten cities during 1937-39, it was estimated that 475,000 to 500,000 persons were being treated for cancer in the United States. It was also estimated that 300,000 new cases were diag-

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Read at the Western Division Meeting, American Public Health Association, Los Angeles, June 12, 1953.

• The cancer problem is increasing as life expectancy increases and greater portions of the populace live to the age at which cancer is more likely.

Early diagnosis still is difficult. Even with modern methods and with considerable public education with regard to cancer, the disease is often not diagnosed until it is beyond the stage at which cure might be effected.

The need for a serodiagnostic test for general screening purposes for cancer detection is tremendous.

The major objective of cancer serodiagnostic test methods is to discover a general test that will detect cancer in a high percentage of cases while it is in an early stage; that will give few "false positive" results; that can be done in any laboratory; and that is simple and inexpensive.

Many serodiagnostic tests for cancer have been published but none has proven worthy of being a good general test to detect cancer. Yet unless some serodiagnostic test which will be suitable for general screening purposes is developed, it is difficult to see how there can be much improvement in the early diagnosis of cancer, particularly internal cancer.

It is hoped that an open-minded attitude will be maintained by physicians on this subject. Recent reports of such a test being developed are encouraging and it is hoped that continued investigations will be confirmatory.

nosed each year. In 1951 it was estimated that at least 700,000 persons were currently under treatment for cancer and that about 525,000 new cases of cancer were diagnosed each year. Approximately one out of every five persons now alive in the United States will have cancer at some time in his life unless new preventive measures are found.[3] With the continued aging of the population more and more cancer cases can be expected and the problem of early diagnosis and appropriate treatment will be materially increased. It is expected that in the year 2000, only 46 years from now, 42.6 per cent of the population will be over 40 years of age as contrasted with 23.4 per cent in 1900, and that the annual number of deaths from cancer will be 415,000.

Today, even with modern methods of diagnosis and considerable cancer education, cancer when first detected (with the exception of skin cancer) is completely localized or in the early stage in less than 30 per cent of cases and only about 50 per cent are considered to be at a stage at which cure may be possible. Approximately 25 per cent of men over age 50 have cancer of the prostate. This fact has been noted in careful histological examinations of the prostate of patients who have died of other causes. The cancer may be latent or inactive, having not yet produced clinical symptoms. The failure to diagnose early breast cancer in women is attributed to the fact that in over 70 per cent of the cases there is no associated pain with the lump in the breast. It is hoped that education and self-examination of the breast will help and will cause women to seek medical advice earlier. The actual number of cases of sub-clinical cancer of the cervix of the uterus is difficult to estimate, but it is probably much higher than is generally thought.

From the foregoing the enormity of the cancer problem, particularly for the future, can be appreciated.

CYTOLOGIC DIAGNOSIS

Cytologic diagnosis attempts to fill in the gap between a general cancer test and biopsy examination. Cytology in cancer detection has been developed by Papanicolaou to help diagnose early cases which might otherwise be missed by the usual diagnostic methods. For many years there has been a reluctance on the part of many physicians to fully value the possibilities of exfoliative cytology. Its widespread use is evidence of its general acceptance as a good diagnostic procedure. This method of examination facilitates the diagnosis of cancer in its earliest stages, before the occurrence of any clinical manifestations of the disease. For this reason it can be used as a method of screening in cancer clinics and it also helps to make each physician's office a diagnostic center for cancer.

When Papanicolaou first suggested the cytologic test it was limited to the female genital tract. At present, secretions from the breast, prostate, bronchi, stomach, esophagus, genito-urinary tract, and exudates from the pleura, peritoneum and pericardium are being studied.

It must be emphasized that a "positive" report on cytologic examination is not a final diagnosis and that biopsy examination must confirm the smear report before definitive therapy is carried out. In cases of suspected lesions in areas of the body not accessible to biopsy, great care must be taken to establish the diagnosis by repeated smear tests and clinical data. One of the major limiting factors in the cytologic test is the small number of persons capable of interpreting the smears. This number is constantly increasing, however.

THE SERODIAGNOSTIC TEST

The serodiagnostic test has been plagued by many problems. There have been many overly enthusiastic persons reporting results before adequate clinical trials, too high a percentage of "false negatives" and "false positives," poor public relations in handling the publicity, exploitation of tests by certain laboratories and physicians, and many other problems. The interest in cancer serodiagnostic methods is keen and it varies from strong enthusiasm to diehard skepticism.

The major objective of the cancer serodiagnostic test methods is to discover a general test that will detect cancer in a high percentage of cases while it is in an early stage, that will give few "false positive" results, that can be done in any laboratory and that is simple and cheap. Like those of the cytologic test, the results of such a serodiagnostic test would be indicative only and final diagnosis would have to be established by the usual clinical, radiological and histological methods.

Dunn and Greenhouse[7] have suggested criteria for a general cancer test as follows: "It must give positive results in at least 90 per cent of the cases with early localized cancer encountered in the general population; and it must give no more than 5 per cent false positive tests in non-cancerous individuals in the general population. On these premises the evaluation procedure involves the following and in this order: (1) determining test results in a group of individuals having cancer, (2) determining test results in a comparable group of normal individuals, (3) determining statistical values for reproducibility of test results for the same technician, between technicians, and for the same test subject over a period of time, (4) determining the effect of other diseases and conditions on test results, (5) investigating other factors possibly affecting test

results, e.g., fasting versus postprandial specimens, fresh versus retained specimens, etc., and (6) investigating suitability of test for mass screening by field trial."

If such a program is carried out according to these specifications much of the confusion now existing regarding non-cytological cancer tests will be dispelled.

The fact that a serologic test reaction "positive" for cancer is sometimes caused by the presence of conditions other than cancer, such as active tuberculosis, cirrhosis of the liver, massive infections, trauma, pregnancy and active rheumatic fever, should not discourage the use of an otherwise reliable general cancer test for screening purposes. In such cases the error usually can be detected readily enough by physical examination and the history.

If periodic tests are made on a large group of persons over a long period, and especially a group in the older age brackets, then real progress can be made. For thus it would be possible to determine the changes that take place in the results of tests before the development of cancer, during illness, and after treatment. Moreover, the changes that occurred during the normal process of aging in individual persons, and the effects of many other diseases, could be observed.

One of the ways to learn more about the effect of the life history of the various kinds of cancer is by means of serodiagnostic methods. Knowledge of what happens from the inactive, subclinical stage to the active clinical stage could be increased; and data could be obtained on cancers that produce death in a few months and others only after many years. Too often cancer is considered as a single disease when in fact it is made up of a variety of diseases each with its own life history and peculiarities.

STUDIES OF VARIOUS PROPOSED TESTS

The cancer tests that have been advocated can be listed under various headings, such as qualitative and quantitative changes in serum protein, immunologic tests, enzyme determinations, etc.

It has been found that the content of proteins in the plasma tends to decrease as a cancer grows. The changes that occur in the plasma proteins when cancer is present are non-specific. There is a general decrease in plasma albumin, as determined by both salt fractionation and electrophoretic methods in persons with cancer. While the changes occurring in the plasma are not characteristic of cancer, the frequency of the occurrence of these changes in association with neoplasm is significant. It has been pointed out by Winzler[21] and others that the nature of the changes in the plasma proteins is still not completely answerable. Other changes that may be present in the plasma proteins in persons with cancer are: (1) increased alpha-1 and alpha-2 globulin content, (2) increased fibrinogen content, (3) decreased amount of iodoacetate required to prevent thermal coagulation, (4) decreased tendency toward thermal coagulation, (5) decreased amounts of polarographically determinable SS or SH groups, (6) decreased "reducing powers" when heated with methylene blue, (7) increased tendency of plasma to become turbid on being heated, and many other changes.

TESTS THAT ARE NOW AVAILABLE

In 1948 Black, Kleiner and Bolker[1] reported they observed that plasma from cancer patients tended to undergo heat "coagulation" more readily than plasma from normal persons. Ericksen, Ellenbrook, Meek and Lippincott,[10] in studying this test, found that the plasma-coagulation technique is not a specific diagnostic test for malignant disease and that it is not suitable for screening purposes.

Hoff and Schwartz[14] reported that the intracutaneous injection of serum obtained from cancer patients who have received radiation therapy produces a diagnostic reaction in patients with cancer. Wiegenstein and Hain[20] repeated this test on a series of 60 patients with definitely proven carcinoma and when only one had the reaction described they concluded that the test has no practical diagnostic value.

Ellenbrook, Meek and Lippincott,[8] after studying the tests for the least coagulable serum protein and iodoacetate index, expressed the opinion that "the results obtained in this study are in agreement with Huggins' statement that these tests are not specific diagnostic tests for cancer. Neither are they specific tests for any type of cancer or of other disease. Because of their lack of specificity and sensitivity they are considered to be unsuitable for use in a cancer screening program, either alone or together." Ericksen, Ellenbrook and Lippincott[9] studied the plasma methylene-blue reduction technique and concluded that it is not a specific diagnostic test for malignant diseases since only approximately 50 per cent of the specimens obtained from patients with cancer gave abnormal results.

Immunologic aspects of cancer. Since immunological reactions have helped in the formulation of useful diagnostic and therapeutic aids in dealing with various other diseases, this feature as related to cancer has been thoroughly studied. The universal serologic reaction is a precipitation reaction manifested in both health and disease. This reaction is constant in the same individual. The presence of antigens and antibodies specific for cancer has not as yet been definitely determined. Greater flocculation reactions of serum with various lipid "antigens" have been observed in patients with cancer.

Penn,[18] Hall, Dowdy and Bellamy[13] described a seroflocculation reaction for cancer that is based on the hypothetical formation of an endogenous carcinogen as a result of disturbed metabolism. In this test, when the "antigen" is mixed with normal serum a fine persistent turbidity occurs, but when it is mixed with serum from a person with cancer there is rapid flocculation of the lipid and clearing of the mixture. Future reports concerning this test may reveal encouraging results.

Enzymes and cancer. Serum acid phosphatase is normally present in low amounts but increases considerably in the presence of metastatic prostatic cancer. Increased serum alkaline phosphatase is found with bone tumors and increased serum lipase with pancreatic tumors.

Winzler[21] expressed belief that it is likely that enzymes known as plasmin, fibrinolysin, serum protease and serum tryptase are identical. Bodansky[2] said that practically all biochemical reactions in the body are catalyzed by enzymes and he listed the following among enzyme activities which have been demonstrated in human serum: adenosinetriphosphatase, aldolase, acid phosphatase, alkaline phosphatase, amylase, beta-glucuronidase, cholinesterase, dehydropeptidase, desoxyribonuclease, esterase, peptidase, plasmin, and ribonuclease.

Present in the plasma are factors that inhibit the action of certain enzymes. West and Hilliard[19] observed that the activity of the chymotrypsin inhibitor increases in cancer and in certain other conditions. They also noted that serum contains an inhibitor of renin activity. These two inhibitors change in amounts during clinical improvement of disease or with its recurrence. West did not advocate the use of a test based on these changes as a diagnostic test for cancer. He recommended that the test be used to determine the growth activity of neoplasms and more specifically to measure the response of the neoplasm to treatment by operation, radiation and administration of certain drugs. Peacock and Sheehy[17] studied the serum inhibitors of chymotrypsin and trypsin and have found that lack of specificity precludes their use as a general cancer test.

Greenstein[12] noted that reduction of the liver catalase level was present only in animals that had rapidly growing tumors and that with slowly growing tumors the liver catalase activity was apparently normal. Catalase is a hematoporphyrin enzyme which acts on hydrogen peroxide to decompose it to water and molecular oxygen. Greenstein expressed belief that the value of this catalase enzyme is only theoretical.

Nakahara and Fukuoka[11, 15] reported the isolation from cancer in humans of a protease-like material that brings about pronounced diminution in the liver catalase of mice when injected intraperitoneally. In 1951 it was reported that the name toxohormone had been given to this tumor fraction and that it could be neutralized by the injection of iron salts. Further investigation of the enzymes of the blood may reveal other instances of a biochemical alteration in a specific organ or tissue caused by the presence of a cancer.

DISCUSSION

In the opinion of the author the secret of the etiology of cancer will be found within the malignant cell itself. The more differentiated malignant cells can closely simulate normal functions, and various degrees of differentiation and de-differentiation may be found in the same tumor at any one time. The changes in the serum proteins are quantitative and it is difficult to see how a very small superficial cancer —for example, a basal cell carcinoma—can be detected in blood studies because only minute amounts of material from the cancer will be mixed in the serum. However, Penn, Dowdy and Hall have obtained positive tests for basal cell carcinomas, carcinoma *in situ* in the cervix, etc. The reaction with their serodiagnostic test is non-specific in that it gives reactions in conditions other than cancer.

Unless some serodiagnostic test which will be suitable for general screening purposes is developed, it is difficult to see how there can can be much improvement in the early diagnosis of cancer, particularly internal cancer. By present diagnostic means it is difficult to diagnose cancer in its earliest, localized, and particularly the subclinical stage before any symptoms are present. There is no known chemical property which is characteristic for cancer alone. There is much to learn about the blood proteins, and methods will have to be found to further fractionate these proteins. Negative results are just as important as positive results in many instances, and it may be that specific tests will be found which will be applicable for special types of cancer and not necessarily for all cancers.

It is hoped that the present program of the National Cancer Institute to aid in the support of serodiagnostic tests will be continued and that the tests will be subjected to the rigid evaluation and control criteria outlined by Dunn and others.

At present there is no serodiagnostic test that is completely specific for cancer, but an open-minded, conservative attitude must be maintained by physicians on this subject, for there is prospect that much useful, practical information will come from present studies and that with added knowledge a general screening test for cancer can be developed.

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New Film Added to A.M.A. Motion Picture Library

"SCHOOL HEALTH IN ACTION," a sound-and-color film produced for the Oklahoma State Department of Health with the cooperation of the Oklahoma State Medical Association, has been added to the A.M.A. motion picture library. This film is the story of Waytoka, a typical city in Oklahoma—how it recognized its school health problems, and through community effort launched a movement for solving these problems.

—The A.M.A. Secretary's Letter

Cerebral Palsy

An Approach to the Problem

PETER COHEN, M.D., San Francisco

• A program for the cerebral palsied child has been developed in California which has been made possible through the cooperation of the state and local departments of education, the state and local departments of health, the Children's Hospital and Orthopedic Hospital at Los Angeles and the University of California School of Medicine in San Francisco. An attempt is being made to deal with not only the medical and educational needs of the cerebral palsied but also the social and emotional aspects.

THE YEAR 1945 is a milestone in the history of cerebral palsy, for it was then that the California State Legislature appropriated almost a million dollars to provide increased services for the children with cerebral palsy, including:

1. Establishment of specialized diagnostic centers.
2. Development of two residence schools.
3. Development of special education and training facilities in public schools.
4. Provision of medical and surgical care.

The State Department of Education has administrative responsibility for the residence schools and diagnostic centers. In Southern California, the Department of Education has a contract with the Children's Hospital and the Orthopedic Hospital, both in Los Angeles, to provide the diagnostic clinic services. In the San Francisco Bay Area the responsibility for the diagnostic center and residence school is shared with the University of California School of Medicine. The State Department of Education also has the responsibility of developing special classes in connection with the local school districts.

Through Crippled Children's Services, the State Department of Public Health and local health departments have responsibility for case finding, for preliminary diagnostic examination and the provision of hospitalization for specific medical and surgical care, as well as aid in providing braces. The public health departments also cooperate in providing physical and occupational therapy in the local schools, as well as medical and orthopedic supervision. The services of public health nurses and medical social workers are made available through the public health departments to the children in the local schools.

The following remarks will be principally concerned with the cerebral palsy diagnostic center and the residence school in Northern California. The center is operated as part of the Outpatient Department of the University of California Hospital, to which any child up to the age of 21 years, with a diagnosis or suspected diagnosis of cerebral palsy is eligible, if referred by a physician or health officer. In the latter case, it is presumed that the diagnosis, or suspected diagnosis of cerebral palsy has been made by a physician. Following this initial referral, an application form is sent to the family in which pertinent information regarding the social and medical history of the child and family is requested. With these data and any additional information sent by the referring physician or health officer, special examinations may be anticipated.

Since the children must be examined on an outpatient department basis, an attempt is made to schedule appointments as efficiently as possible. In any case, every child is examined by one or more physicians, depending on the nature of the involvement. A psychological evaluation is made and the family is interviewed by a medical social worker. Usually, an x-ray film of the skull and an electroencephalogram are also obtained. An orthopedist, a pediatrician, and a neuropsychiatrist are available during the visit to the clinic in the event their services are required. Also available are a speech therapist, a physical therapist and an occupational therapist. If it becomes apparent that other special examinations are necessary—such as an ophthalmological or otological examination—the child is referred to the appropriate clinic. With this information obtained, an attempt is then made to determine the cause of the child's difficulties, the nature and the degree of involvement. Recommendations are made and interpreted to the family, and these, together

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Presented before the Section on Public Health at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

with a summary of the findings, are sent to the referring physician and/or local health officer.

Interviews by the medical social worker often bring out serious social and emotional problems faced by the parents. Such a professional person is skilled in getting parents to talk about their problems, often bringing out facts which the physician may not ascertain and which are important to know in evaluating the total picture and in making recommendations for further care.

Where there is some question or where the staff has a special interest in a particular type of problem, the patient is asked to return for further evaluation. If the child lives in a community where no follow-up and no facilities are available for the special care he needs, the child will be followed in the diagnostic center or referred to the residence school for a stated period.

ADMITTANCE TO RESIDENCE SCHOOL

Children are admitted to the residence school upon recommendation from the diagnostic center. The selection of children for admittance is based on many factors, among which the following points are given principal attention:

1. Intensive therapy is required and local facilities are not available.

2. Study and evaluation of severely affected children when evaluation cannot be adequately done on an outpatient basis.

3. Owing to a social or emotional problem, the child is not making expected progress either physically or educationally, although local facilities are adequate.

4. Special learning problems, even though the child may be receiving adequate supervision locally for his physical problems.

While in the residence school, the child receives the kind of therapy he needs, plus an educational program designed for his particular needs. The treatment by the therapists is designed to make the child more independent, to walk, if only with the aid of crutches and braces, to improve his self-help skills, to learn activities which may lead to future vocation or hobbies, and to communicate with others. The stress is on functional activity. His treatment is supervised by a pediatrician in consultation with specialists such as an orthopedist, physiatrist, neuropsychiatrist, ophthalmologist and otolaryngologist. Each child receives dental examination and necessary treatment.

While in the school, the child is made as self-sufficient as possible, with the treatment and training program carried over into the schoolroom, dormitory, dining room and recreation areas. The teachers and attendants are kept informed of the self-help skills and abilities so that each child may continue to practice the skills he learns in the therapies. This is done by means of cards which are posted in the appropriate areas for reference by those caring for the children.

On visiting days the families are informed of the child's progress. Periodically they are invited to visit during the week, in order to observe the child receiving therapy at school and to learn how to carry on with the child after he leaves the school. They are given an opportunity to visit just before the child leaves the school and are indoctrinated by the therapists with the techniques necessary for treatment.

In conjunction with the school, a Parent-Teachers' Association has been organized. It meets at stated intervals to discuss matters relating to problems of cerebral palsy. This has been most successful as an educational program and as a form of group therapy for the parents. Some of the meetings are addressed by members of the staff of the residence school. At other meetings, the parents bring up questions which *they* discuss, with a member of the staff acting as moderator. As a result of these discussions, some very practical advice is given to the group by other parents who have had experience in meeting the problems which are brought up.

Staff conferences are held at various times while the child is at the school, in order to assess individual progress and to plan further treatment. Both the educational and the medical staff participate in these conferences. At the final staff conference, when the entire problem is reviewed and the progress of the individual child is indicated, representatives from the child's own community (both from the school department and the health department) are invited to hear the recommendations to be made, since they are the persons who will be working with the child. An educational report and medical report are sent to the local school and health department.

RESEARCH AND TRAINING

The program also offers an opportunity to train individuals for work with cerebral palsied children. Students from Stanford University, University of California and Mills College are given the opportunity for doing field work in physical therapy, occupational therapy and speech therapy at the residence school. In addition, a six-week course for teachers interested in handicapped children is held every summer at the residence school under the auspices of San Francisco State College. Medical students and nursing students from the University of California have an opportunity to observe the program and to obtain information regarding the problems encountered in cerebral palsy.

The clinic and school offer an extensive opportunity for research activities into the nature and treatment of cerebral palsy. Some of the studies that have been carried out include: a review of encephalographic records in cerebral palsy patients,[1] the relationship of mental deficiency to cerebral palsy,[2] and the effect of the cerebral palsied child on the family. Other studies which are under way include the relationship of learning disturbance in the child with kernicterus, the integration of the social worker and physician, special evaluations of bracing techniques and special equipment for the cerebral palsied child, the pathogenesis of cerebral palsy, the etiological factors in cerebral palsy, and the value of surgical procedures. A study of children who have been discharged from the residence school is under way. Moving picture records of some of the children are often made for study and comparison during treatment. A motion picture, "A Place in the Sun," that was made with the assistance of the Junior League of San Francisco, depicts the program of the cerebral palsy diagnostic center and residence school. This picture has had wide distribution throughout this country and abroad.

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State Medical Journal Conference

EDITORS AND BUSINESS MANAGERS of the various state medical journals came to A.M.A. headquarters on November 9 and 10 for the 1953 State Medical Journal Conference. With a total registration of 131, representing publications from Maine to Hawaii, the two-day seminar offered a wide coverage of subjects. Of particular interest to the editors and their assistants were talks by Paul de Kruif, Dr. Julian P. Price, Fred C. Sands of the Schering Corporation, and Prof. Paul D. Bagwell, head of the department of communications skills, Michigan State College.

The business representatives gave careful consideration to the ideas presented by Dr. Austin Smith; R. Blayne McCurry of Abbott Laboratories; William T. Coulter of Bruce Publishing Company; Alfred J. Jackson, who made a general report on the State Journal Advertising Bureau; Kenneth B. Butler of the Butler Typo-Design Research Center, and Gilbert S. Cooper of the A.M.A. specialty journals, who suggested new techniques which will doubtless be reflected in several of the journals.

—The A.M.A. Secretary's Letter

The Solitary Pulmonary Lesion

IVAN A. MAY, M.D., KASH ROSE, M.D., and DAVID J. DUGAN, M.D., Oakland

• *Pulmonary cancer when localized to the lung, is curable by operation. Tumors found by routine x-ray examination before they cause symptoms are much more often confined to the lung and as such are curable. Unlike other internal growths which are more hidden, lung tumors can often be seen early on x-ray films of the chest.*

X-ray films of the chest were made routinely on all patients entering a hospital, regardless of the nature of their illness. In all, some 40,000 films were made. Sixty patients were found to have unsuspected solitary lesions in the lung. Twenty-four of the lesions were diagnosed and treated by operation and removal. Twelve were diagnosed by other methods. Of the 36, eight were cancer of the lung, an incidence of 22 per cent. There were also 14 localized tuberculous nodules which are best treated by removal.

Since early cancer is surgically curable, it is felt that everyone over the age of 40 should have a routine x-ray examination of the chest every six months. Solitary lesions of the lung found should be excised for diagnosis.

THE INCREASE IN NUMBER of routine roentgenograms of the chest being taken nowadays, due to "surveys" of the populace and to the more frequent use of x-ray films by physicians in thorough examination of patients, is disclosing unsuspected abnormalities in many cases. Survey films disclose thoracic abnormalities in about 3 per cent of the persons examined — tuberculosis for the most part. Other pathologic conditions, including carcinoma, are noted in a significant number.[3, 4, 19] In patients who are under the care of a physician the incidence of lesions is considerably higher than that: Unsuspected lesions in the chest were noted in 10 to 12 per cent of patients who were subjected to a roentgen survey in a general hospital.[18] Pulmonary tumors were detected, by roentgenogram, in 91 (0.6 per cent) of 15,000 patients in the University of Chicago Clinic outpatient department.[6]

Among the abnormalities that may be detected by roentgen study are those known as solitary lesions of the lung. They are round or ovoid nodules with sharp or indefinite borders which are located completely within pulmonary tissue. Usually the nature of such lesions cannot be determined save by surgical resection and microscopic study.

Now that physicians are aware of the significance of such lesions, they are more often noted. It is important to have a roentgenologist's interpretation of a film in which such a lesion is seen, for the innuendo of his report is of considerable influence on the attitude of attending physicians. Whereas in the past a lesion might have been reported as "a small infiltration, probably old tuberculosis, inactive or healed," it is now reported as a localized pulmonary lesion of unknown nature. This focuses attention on the lesion and stimulates further investigation.

The diagnosis of intrathoracic masses can seldom be made with certainty by roentgenograms alone. Unless fairly conclusive evidence is obtained from the history, physical examination, laboratory studies, endoscopy, fluoroscopy and/or angiocardiography, exploratory thoracotomy is necessary for diagnosis and usually should be done unless the general condition of the patient precludes. It has long been accepted treatment to carry out exploration in the presence of larger lesions which either by roentgenogram or symptoms suggest carcinoma, but the smaller isolated asymptomatic pulmonary lesions have often been regarded as relatively innocuous and have been watched or forgotten. In recent years, however, a number of reports have appeared on series of cases in which such lesions were resected. In them it was noted that a rather high proportion of the lesions were tuberculomas (many of them containing viable tubercle bacilli) and a smaller but still alarming proportion were carcinomas (Table 1).

It is now generally accepted that tuberculomas should be resected not only for diagnosis but because of the possibility of release of bacilli and reactivation of tuberculosis. Black and Ackerman[5] reported that of 18 tuberculomas of the lung removed at exploratory thoracotomy, all contained encapsulated areas of caseous tuberculosis. Several investigators[2, 8, 12, 13] have expressed the opinion that if a tuberculoma contains calcium, watchful

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From the Veterans Administration Hospital, Oakland.

TABLE 1.—*Diagnosis of lesions in ten series of cases of solitary pulmonary lesions*

Reported by	Number of cases	Malignant Lesions No.	%	Bronchogenic Carcinoma No.	%	Metastatic Carcinoma	Tuberculoma No.	%	Undiagnosed Granuloma No.	%	Tuberculosis	Sarcoma	Lymphosarcoma	Thymoma
Grow et al[14]	86	20	23	....	....	..	....	....	....	....	....	....	....	....
O'Brien et al[17]	21	9	43	8	38	..	....	....	....	....	....	1	....	....
Effler et al[10]	24	4	15	1	....	1	7	29	....	....	1	1	1	....
Davis and Klepser[9]	67	37	55	33	49	2	17	25	....	....	....	1	1	....
Sharp and Kinsella[20]	55	15	27	11	20	3	11	20	11	20	....	....	1	....
Mahon and Forsee[16]	55	4	7	2	3.5	1	48	87	....	....	....	1	....	....
Effler[11]	16	7	43.7	6	37.5	1	3	....	....	....	5	....	....	....
Harrington[15]	16	5	31.2	2	12.5	3	....	....	4	25	....	....	....	....
Abeles and Ehrlich[1]	21	8	38	5	23	1	5	23.3	....	....	....	1	....	1
Wolpah[22]	25	8	32	6	25	2	7	28	3	12	....	....	....	....

waiting is justified. Tuttle,[21] however, pointed out that the mere presence of calcium in the lesion does not assure that it is not carcinoma. (In one case in the series reported upon herein, a bronchogenic carcinoma appeared, roentgenographically, to contain calcium.)

That carcinoma of the lung may remain unchanged in roentgenographic appearance for long periods of time is well known, and in one reported case a well differentiated epidermoid carcinoma of the lung was observed in roentgenograms taken from time to time over a period of eight years.[7] In light of this knowledge, the authors believe that any undiagnosed pulmonary lesion should be resected.

CLINICAL MATERIAL

In the six years 1947-1952 60 solitary lesions of the lung were noted in roentgenograms of the chest taken routinely of some 40,000 patients admitted to the Veterans Administration Hospital, Oakland, in that period. Diagnosis was ultimately made in 36 of the 60 cases (Table 2), in 24 by operation and in 12 by other means including autopsy, the finding of a primary tumor elsewhere, subsequent development of active tuberculosis or carcinomatosis. In a case of brucellosis pneumonia, diagnosis was made by clinical and laboratory methods and the patient was cured by treatment.

In 24 cases, most of them early in the series, the nature of the lesions was not determined. Thoracotomy was not done, usually because the patient felt healthy and was unwilling. In some instances, for various reasons, the attending physician did not feel operation was indicated. The latter factor has waned as the significance of the authors' statistics has become more apparent. At present, operation is advised and carried out in almost all cases.

SURGICAL PROCEDURE

The surgical procedure most often used was wedge resection of the peripheral lesions (see Table 3). Diagnosis then was made by examination of frozen sections and further operation was done when indicated. Lesions that were not peripheral were sometimes removed by enucleation. This did not seem quite as satisfactory, in that it is more difficult to remove an adequate margin of normal tissue and closely adjacent microscopic tubercles are more likely to be left in the lung. One large lesion was removed by segmental resection and one by lobectomy for diagnosis. In two instances in which carcinoma was inoperable owing to mediastinal lymph node metastasis, only exploration and excision of a specimen for biopsy were done. None of the 24 patients operated upon died. Complications occurred in only one case: Tuberculous empyema developed after enucleation of a tuberculoma, although tubercle bacilli did not grow on a culture of material from the lesion. The empyema was drained and soon healed under antibiotic treatment.

TABLE 2.—*Diagnoses of solitary pulmonary lesions in present series*

		No.	Per Cent
Bronchogenic carcinoma		8	22
Proved	7		
Clinical course	1		
Metastatic tumor (primary found elsewhere)		4	11
Granulomata		18	50
Tuberculoma	4		
Caseous nodule	2		
Nodule—subsequent active tuberculosis	3		
Type undetermined (probably tuberculosis)	5		
Fungus:			
Torula	1		
Type not determined	2		
Foreign body	1		
Hamartoma		3	8
Arteriovenous fistula		1	3
Brucellosis pneumonia		1	3
Pleural plaque		1	3
		36	100

POSTOPERATIVE TREATMENT

One patient was found to have nodular tuberculosis throughout the rest of the lung when the single lesion seen in a roentgenogram was resected. He was

TABLE 3.—*Surgical procedure, diagnosis and results in 24 cases*

Age	Operation	Diagnosis	Result and Period Observed
30	Lobectomy	Torula granuloma	Cure—6 years
21	Wedge resection	Active tuberculosis	Arrested by treatment—4 yr. 10 mo.
53	Exploration and biopsy	Inoperable epidermoid carcinoma of lung	Died, six months after operation
55	Excision	Pleural plaque	Cure
30	Wedge resection	Fungous granuloma	Cure—3 yr. 7 mo.
30	Wedge resection	Granuloma	Cure—3 yr. 6 mo.
70	Wedge resection, then lobectomy	Undifferentiated carcinoma of lung	Asymptomatic 3 yr.
60	Exploration and biopsy	Anaplastic bronchogenic carcinoma	Died, five months after operation
30	Enucleation	Hamartoma	Cure
36	Wedge resection	Granuloma	Cure—2 yr. 2 mo.
54	Superior segment then lobectomy	Poorly differentiated carcinoma of lung	Asymptomatic 1 yr. 11 mo.
26	Wedge resection	Fungous granuloma	Cure—1 yr. 10 mo.
43	Enucleation	Granuloma	Cure—1 yr. 9 mo.
61	Wedge resection, then lobectomy	Adenocarcinoma of lung	Died of brain metastasis 1 yr. post-operatively. Chest x-ray clear
55	Wedge resection	Tuberculoma	Cure—1 yr. 5 mo.
26	Wedge resection	Tuberculoma	Cure—1 yr. 4 mo.
27	Wedge resection	Granuloma	Cure—2 yr. 3 mo.
30	Wedge resection	Tuberculoma	Cure—2 yr. 1 mo.
37	Enucleation	Tuberculoma	Postoperative tuberculous empyema now healed, 1 year
53	Segmental resection	Arteriovenous fistula	Cure
28	Enucleation	Caseous tuberculoma	Cure—1 yr.
39	Enucleation	Foreign body granuloma	Cure
42	Wedge resection	Caseous granuloma	Cure—9 mo.
56	Wedge resection, then lobectomy	Squamous cell carcinoma of lung	Asymptomatic 8 mo.

treated with rest and antibiotics. Five other patients with tuberculomas and five with granulomas assumed to be tuberculomas because no other diagnosis could be made, were not treated by rest or antimicrobial therapy since it was felt the disease was confined to the lesions removed. In none of these cases has active tuberculosis become apparent to date.

DISCUSSION

In 36 of 60 cases in which solitary lesions of the lung were noted in routine roentgenograms the nature of the lesion was ultimately diagnosed. Eight were primary bronchogenic carcinomas, an incidence of 22 per cent. Four were metastatic carcinomas, which were not excised because the primary tumor was not controlled. Fourteen were localized tuberculous foci which are best treated by removal. In three cases in which solitary pulmonary lesions were seen roentgenographically but were not resected, active tuberculosis developed later. Carcinomatosis developed in one case from a pulmonary lesion that the patient refused to have removed.

Of the 24 patients operated upon, only four had lesions which were clinically benign—one foreign body granuloma, one pleural plaque, one hamartoma, and one arteriovenous fistula without clinical or physiological evidence of arteriovenous shunt.

In light of the high proportion of cases in which these lesions are found to be malignant or otherwise potentially inimical, it is felt that excision for diagnosis is indicated, since rarely can diagnosis be made by any other means.

Unlike other internal neoplasms, pulmonary lesions can frequently be detected in the presymptomatic phase by roentgenographic examination. Carcinoma of the lung may be cured by resection if operation is done before spread has occurred. Since asymptomatic tumors detected on routine roentgenograms are often confined to the lungs, routine roentgenographic examination of the chest at six-month intervals seems advisable, especially for men over 40 years of age.

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VA to Ask Financial Information in Non-Service Connected Cases

UNDER A NEW POLICY, Veterans Administration from now on will ask additional information from a veteran applying for hospitalization of a non-service connected condition. Previously, the veteran had only to answer the question: "Are you financially able to pay the necessary expense of hospitalization or domiciliary care?" If the answer was "no," the veteran was eligible. Now the veteran will be required to answer the following additional questions:

1. What is the current value of your property, real and personal? *2.* What is the current amount of your ready assets in the forms of cash, bank deposits, savings bonds, etc.? *3.* If you own real property, what is the approximate amount of the unpaid mortgage or other indebtedness? *4.* What are your average monthly expenditures, including mortgage payments and all other personal expenses, including your expenses for dependents? *5.* What was your average monthly income for the last six months, from all sources?

However, VA states that, "This addendum may be used in no way whatever to deny hospitalization to a veteran, as the law specifically provides that 'the statement under oath of the applicant . . . shall be accepted as sufficient evidence of inability to defray necessary expenses.' [It] is designed to protect applicants for hospitalization, and veterans generally, from charges of 'chiseling' on the government."

—A.M.A. Washington Letter

Management of Refractory Shock

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▪ *The one feature that characterizes all shock, regardless of its cause, is a reduction in the effective circulating blood volume. The reduced blood volume leads to decreased venous return, decreased cardiac output, vasoconstriction, tachycardia, hypotension, tissue anoxia and death if the sequence of events is uninterrupted. Immediate therapy must be directed at restoration of the blood volume, preferably with whole blood. Infection must be controlled by use of antibiotics intramuscularly and intravenously.*

If shock persists, aqueous adrenal extract should be administered in large quantities. As a last resort, a vasopressor should be tried.

SHOCK RESULTS from a breakdown in the normal circulatory efficiency. This efficiency is dependent upon normal blood volume, normal volume of the vascular bed and a normal myocardium.

Experimentally and clinically the one feature which characterizes shock is a reduction in the effective circulating blood volume. The blood volume deficit may be due to loss of whole blood or plasma or to sequestration of an abnormally large amount of blood in the splanchnic bed. In each case there is a reduction of the volume of circulating blood with a decrease in the volume of venous return to the right side of the heart and a decrease in cardiac output. In order to compensate for this, the body initiates the chain of events which characterize the compensatory phase of shock.

The mechanism of shock is still under study and at present it is not possible to give more than a consensus of opinion regarding the nature of the physiologic disturbance. As observed experimentally, traumatic shock and hemorrhagic shock, which are the most common kinds of clinical shock, are quite similar. In both fluid is lost from the intravascular space, owing to sequestration in the extravascular space in the one condition and bleeding in the other.

However, clinically the problem of shock is vastly more complex, for seldom if ever is only one mechanism of shock functioning. Usually the injured or sick person not only has loss of blood, but he also is affected by pain, anxiety and variations in temperature and moisture. In addition he is subject to the influence of any drugs that may be administered. Lastly, the ability of the patient's bodily defense mechanisms to compensate for any injury will depend to a great extent on his age and general physiological status at the time of the bodily insult.

The classical signs of shock comprise a symptom complex that is seen following hemorrhage, trauma, dehydration, electrolyte disturbances, anoxia, infection, neurogenic disturbances and myocardial decompensation. Any one of these mechanisms may initiate shock, and in many cases there may be two or more of these mechanisms functioning synergistically to intensify the shock state.

Part of a Symposium on Nutrition and Electrolytes presented before the Section on General Surgery at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

The importance of loss of blood is well understood but the role of infection in shock is probably not adequately appreciated. Infection may decrease the volume of blood as a result of vomiting, diarrhea or exudation, as in peritonitis, pleurisy or pneumonia. The vascular bed may be dilated as a result of the effect of exotoxins on the capillaries. The exotoxins may cause profound myocardial depression. There may be interference with oxygenation as a result of toxic hemolysis of erythrocytes. Lastly it is possible that an anoxic liver can no longer detoxify the bacterial flora normally presented to it.

When a reduction in the volume of blood occurs, neuroadrenergic activity results in vasoconstriction in order to attempt to accommodate the vascular tree to the decreased volume of blood. The constriction is initially most intense peripherally in the skin and muscles but, if it persists, eventually involves the gastrointestinal tract, kidney, liver, brain and heart in that sequence. As a result of skin and kidney anoxia, a substance called V.E.M. (vasoexcitor material) is produced in excess. This acts on the precapillary sphincters to intensify the vasoconstriction in an attempt to shunt the blood to the more vital organs. If this process continues the liver becomes anoxic and produces a substance called V.D.M. (vasodepressor material). This relaxes the capillary sphincters, causing pronounced dilatation of the vascular tree. There then is sequestration of the blood from the circulation, which may so greatly intensify

shock that death may result. While loss of blood is the usual initiating agent of this sequence of events, anoxia, dehydration, electrolyte disturbances and other conditions will hasten or intensify the phase of decompensation.

Since in clinical shock the most common primary mechanism is loss of blood, rapid and adequate replacement of blood by transfusions usually corrects the deficit and the chain of events previously described can be averted. Theoretically and practically, the average healthy adult can lose 15 to 20 per cent of his blood volume without ill effect. Loss of 20 to 30 per cent of blood volume will cause mild shock. In the average person loss of 30 to 40 per cent of blood volume will result in moderate to severe shock. If more than that is lost, the shock state is usually severe. Unfortunately the person in shock is not always in the optimum physiological condition prior to the onset of shock. Therefore these figures are only rough approximations. After prolonged shock, even if the hypotensive state is rectified, several grave sequelae may result. These are cerebrovascular thrombosis, myocardial infarction and lower nephron nephrosis. Any of them may result in death or in delayed convalescence.

Patients in mild shock recover without need of restoration of blood volume, and in some cases of moderate shock minimal resuscitative measures are adequate. However, in many cases of moderate shock and in all in which the condition is severe, intensive therapy is necessary, for without it the patient may die. In a few cases hypotension persists despite the usual therapeutic measures but the patient does not die. This state is called refractory shock. Prominent among cases of shock of the latter type are those in which shock has been undiagnosed or untreated for a considerable period of time. Not uncommonly this occurs in a patient who is left unattended in the period immediately after a major operation.

In any case of refractory shock, many factors must be carefully appraised. If restoration of the blood volume has been inadequate, more blood must be given. Although care must be taken not to overexpand the circulating blood volume, it is much more common to underestimate the volume of fluid lost. Internal hemorrhage must always be considered and, if present, must be controlled by appropriate measures. The fluid and electrolyte balance must be corrected with water, sodium chloride and potassium chloride. Rarely, ammonium chloride will be needed to correct uncompensated refractory alkalosis. Infection, either as peritonitis or septicemia is occasionally unsuspected or overlooked in surgical cases. It must be vigorously treated with antibiotics. Administration of penicillin intramuscularly is not adequate therapy; one of the broad-spectrum antibiotics should be given intravenously. Although on theoretical grounds oxygen is not of much help in the treatment of shock, clinically its use is endorsed. The airway and lungs must be clear of obstruction and only the minimum quantity of narcotics and sedatives should be used since they all depress the respiratory center.

In addition to these possible causes of refractory shock, there are certain mechanisms unrelated to the primary shock problem which may prevent normal restoration of the hemodynamics unless specific measures are taken to overcome them. Intestinal obstruction, especially obstruction of strangulating type, may be overlooked in a patient in shock. Acute gastric dilation, a condition that can be relieved by insertion of a Levine tube, may be overlooked and cause the death of a patient in shock. Coronary occlusion or pulmonary embolus can cause an exaggeration or prolongation of the shock state. Acute hemorrhagic pancreatitis may supervene upon a preexisting state of shock, especially in a patient who recently has had an operation in the upper part of the abdomen.

Whole blood, properly typed and cross matched, is universally preferred as the most vital agent in the treatment of shock. It contains water, crystalloids, colloids and erythrocytes. When it is introduced into the circulation it is likely to remain there, not only because of the plasma colloids but because of the size of the erythrocytes, which cannot get through the normal capillary walls. In addition the added red cells act to increase the amount of oxygen that is carried to the tissues. While plasma was extensively used in World War II as a blood volume expander, it is falling into disuse save in emergency, for it causes hemodilution, will pass through the capillary wall, and does not provide red cells for transportation of oxygen. Whenever it is used to correct a deficit of more than 30 per cent in volume of blood, whole blood or washed red blood cells must be given to correct the anemia. A further disadvantage to the use of plasma is the possibility of post-infusion serum hepatitis. However, plasma is especially good to use in the early treatment of shock secondary to burns. Human albumin can be used in emergency as a temporary blood expander but it is very expensive and must be followed by infusion of blood.

Since World War II the colloid plasma volume expanders have been extensively studied. The drug upon which the most favorable reports in this country have been written, by both military and civilian investigators, is dextran, a storable, relatively nontoxic material that can be used without danger of serum hepatitis. When the blood volume deficit exceeds 30 per cent, although dextran is effective in initially relieving the shock state the resultant hemo-

dilution must be corrected with either whole blood or suspensions of washed erythrocytes as soon as possible.

The usual route for administration of blood is intravenously, and it may be desirable in severe shock to use two or three veins at once and to infuse it at a rapid rate. It is fallacious to withhold blood on the premise that raising the blood pressure to a normal level may "blow-out" thrombi and result in further hemorrhage.

Intra-arterial transfusions are being used more commonly. Certainly if there is any indication for intra-arterial transfusion it is in refractory shock. In the past the radial artery has been canulated and the distal portion ligated, but there have been some reports of gangrene of the hand as the result of inadequate flow of blood when this method was used, owing to absence of the palmar arch. This danger can be obviated by using any of the large arteries. The blood need not be infused under great pressure. In fact it has been reported that high pressures are deleterious. The blood should be given with an initial pressure of 80 to 90 mm. of mercury and kept 10 to 20 mm. above the systolic pressure. Once the systolic pressure reaches 110 to 120 mm. of mercury the need of the transfusion should be ended. On the basis of extensive hemodynamic observations, Maloney recently concluded that intra-arterial transfusions are no more efficacious than intravenous ones. However, it still would seem to be a worthwhile procedure in a patient with refractory shock.

In view of present knowledge, the eosinophil content of the blood should be determined in every case of refractory shock, and, if it is elevated, aqueous cortical extract should be administered intravenously —100 to 150 cc. of it in 500 or 1,000 cc. of fluids. This is a recommended therapeutic dose in the treatment of Addisonian crisis.

Cortisone and corticotropin (ACTH) have been suggested as therapeutic aids in the management of refractory shock. However, all investigators doubt their efficacy. If they are used, it must remembered that the effect of both is delayed. It takes two to four hours for corticotropin to reach its maximum effect and eight to twelve hours for cortisone. Therefore, when either is used, aqueous adrenal cortical extract should be used in conjunction for its immediate effect.

There is much dispute as to the value of the vasopressors in shock. Certainly in the vast majority of cases they do no long term good and may do harm. Nevertheless in some cases, especially if complicated by nerve or spinal cord damage, the vasopressors may be life-saving. Neosynephrin® is the safest agent to use, since it is least likely to cause increased myocardial irritability. One of the most satisfactory methods is to dissolve 10 or 20 mg. of Neosynephrin in a liter of fluid and then adjust the rate of infusion to keep the blood pressure at the desired level. Epinephrine or ephedrine may be administered intramuscularly.

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Clinical Experience with the Portable Electromagnetic Ballistocardiograph

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• *The purpose of ballistocardiography is to obtain a rough objective measurement of the strength of the heart beat. Recordings have been made with a portable electromagnetic instrument on 225 persons, some normal, others with many kinds of cardiovascular disease, to determine the usefulness of the ballistocardiograph. Tracings were made at certain stages of respiration at rest and after exercise.*

The ballistocardiograph can in some cases be the principal diagnostic instrument in distinguishing cardiac from extracardiac disease, in the early detection of coronary artery disease, and in the diagnosis of myocarditis. It also may aid in the diagnosis of high output failure, pericardial effusion, nicotine sensitivity and coarctation or other occlusive disease of the aorta.

BALLISTOCARDIOGRAPHY is a system for recording the forces generated by the movements of blood in and out of the heart and great vessels. While the physiologic functions reflected in ballistocardiographic waves are not thoroughly understood, the basic concept is not complicated. What is sought is a rough, objective measurement of the strength of the heart beat.

Impetus for the practical use of the ballistocardiograph stems from Dock's[5] studies and development of a small, inexpensive instrument. Clinical experience with a portable electromagnetic instrument has indicated the circumstances in which the ballistocardiogram may be of help to a practicing physician. For a comprehensive survey of the historical background and the theoretic considerations the reader is referred to the textbook by Brown and coworkers,[2] and to the work of Henderson,[10] Starr,[18] Nickerson[15] and Hamilton.[8]

MATERIALS AND METHODS

Ballistocardiograms were made on 225 persons; on some of these persons several tracings were made at intervals. The subjects included normal adults of all ages and patients with many kinds of cardiovascular disease. At the time of this report the study had been in progress 18 months.

The subject lies at rest on a heavy wooden table for five minutes before a tracing is taken. Light clothing may be worn but the shoes are removed. The feet are elevated on a sponge-covered stand four inches in height. A lightweight board bearing two electric coils is placed upon the shins. Between these coils, but supported by its own stand, a powerful magnet is placed. Pulsations of the circulation cause the coils, supported as they are by the shins, to move headward and footward in the magnetic field, this motion inducing a current which passes through the coils and is filtered through a condenser and transmitted to the right and left arm leads of a direct-writing electrocardiograph. Into this circuit, in series or parallel, a resistor is introduced in order to superimpose a QRS complex on the electrocardiogram for timing.

From the Wadsworth General Hospital, Veterans Administration Center, and the Department of Medicine, University of California, Los Angeles.

Records are taken with the breath held, with normal respiration, with the breath held in deep expiration and in deep inspiration, and also, when indicated, after exercise. A light shoulder tap is used to detect movement of the body on the table, and to obviate technical error in the recording apparatus. This method of detection has proved to be a satisfactory substitute for the standardized weight and distance "foot-blow."[12] A standardization of 1 millivolt per centimeter of stylus deflection is used.

NORMAL FINDINGS

In a normal subject G, H, I, J, and K waves are recorded in systole and L, M, N, and O waves in diastole. As depicted in Chart 1, the H wave immediately follows the R peak of the electrocardiogram and the K wave corresponds to the end of the T wave and the electrocardiographic recording of systole.

What forces give rise to the various waves is still a matter of controversy. The G wave probably represents recoil from auricular systole; the H, the torsion of the ventricle during the period of isometric ventricular contraction and/or auricular systole; the I, footward recoil from ventricular ejection; the J, sudden deceleration of blood as it strikes the aortic arch and main pulmonary arteries; the K, deceleration of blood in the descending aorta as it meets

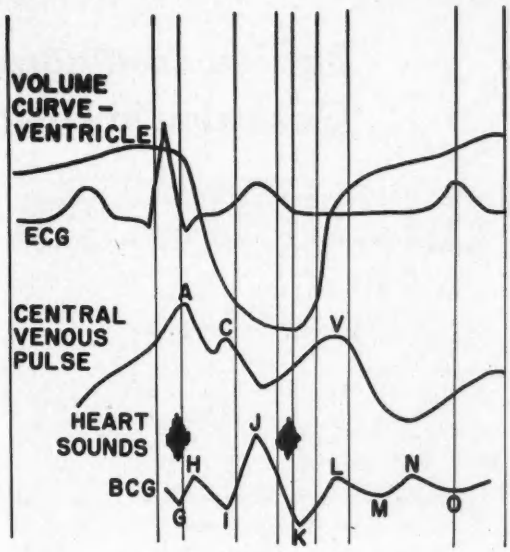

CHART 1

Time correlation of the ballistocardiogram (BCG) and electrocardiogram (ECG) with other events in the cardiac cycle.

peripheral resistance. The diastolic waves may be passive after vibrations[18] or may represent definite cardiovascular movements.[7, 9]

Normality is determined chiefly from the general repetitive pattern and relative amplitude of the waves. Measurements vary with each apparatus. With the apparatus here discussed, the J wave in a normal reading is at least 5 mm. in amplitude and the I wave about 2.5 mm. The JK stroke is ordinarily 1 or 2 mm. deeper than the IJ. The H is the smallest systolic wave, about 1.7 mm. in height. Normally peaks are rather sharp and without notching. Standards for the GK and QI intervals have been established experimentally,[11] but in the present study it has not been possible to formulate such standards precisely. On inspiration there is an increase in amplitude of the waves which does not normally exceed 40 per cent.

As Starr[19] and others have pointed out, there is a normal difference in the ballistocardiograms of older persons, principally diminution in the size of the I and J waves. In the series here reported, about 40 per cent of clinically normal subjects over the age of 50 years have records which are abnormal in comparison with young adult standards. With any subject, however, complete distortion of the pattern or sudden change from previous recordings probably indicates disease.

RESULTS

No attempt has been made to summarize findings in all the records taken. Instead, tracings are presented which illustrate clinical situations in which the ballistocardiogram can be useful.

Brown and DeLalla[2] have classified their records into four gradations of abnormality. Their system of terminology is not used in this report because it is an attempt to quantitate degrees of abnormality. As the instrument used in the present study is far from quantitative, three categories — normal, borderline, and abnormal—are employed. This presentation is limited to abnormalities in specific phases of the tracing and patterns found in specific diseases. Figure 1 is a normal record for comparison with the abnormal tracings.

1. *Alterations due to respiration.*

Although respiratory variations are normal, when the complex in the expiratory phase is completely bizarre, abnormality is indicated. Such a finding may be the first indication of coronary artery disease[12] as illustrated by Figure 2. Less striking, but definite changes can also be detected in anxiety states associated with vasomotor instability (Figure 3).

Normally, the record on deep inspiration is of definitely greater amplitude than that on deep expiration. In pericardial effusion this finding is reversed and a true "paradoxic" ballistocardiogram is obtained. Figure 4 illustrates this result and the return to normal after subsidence of the effusion.

Caccese and Schrager[3] have observed changes in the ballistocardiogram on smoking. Similar research has been reported by Mandelbaum and Mandelbaum,[13] who recommend the use of the ballistocardiograph as a detector of nicotine sensitivity and suggest that abnormal findings be considered a contraindication to smoking, particularly for persons with coronary artery disease. Figure 5 illustrates changes in the record of a subject who had symptoms of dizziness, chest discomfort, and cold, sweating palms on smoking and obtained complete relief by discontinuance of smoking.

2. *Primary myocardial disease — changes in wave relationships.*

Figures 6 and 7 illustrate changes observed in one case of periarteritis with myocardial involvement and in one of active rheumatic carditis. Although in these cases, heart involvement was evident by other methods of examination, the ballistocardiogram may be the only sign of abnormality in myocarditis.[6]

3. *Failure at high output—amplitude of the waves.*

The use of the ballistocardiogram as a measure of cardiac output is a controversial issue.[8, 16] Certainly, the instrument used in the present study, which is an indicator of velocity, is not a satisfactory measure of output.[1] However, inasmuch as the speed of systolic ejection may be related to stroke volume, some valuable information regarding the force of ven-

Ballistocardiograms Occurring in Various

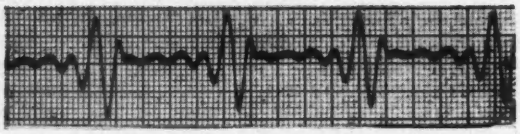

Figure 1.—Normal 46-year-old negro.

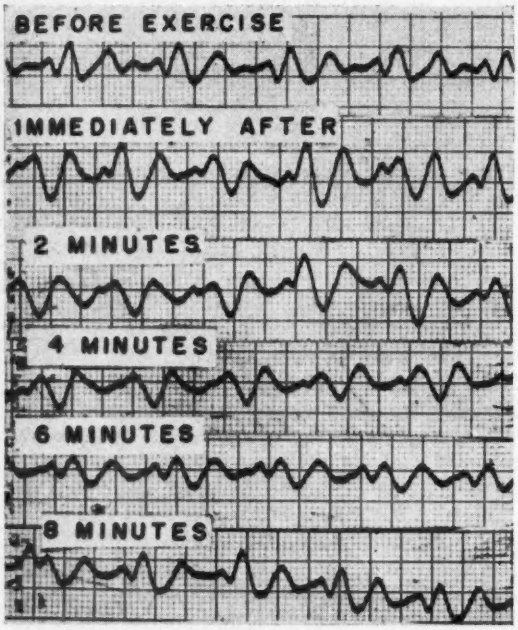

Figure 2.—A 40-year-old man who, upon exertion, had recurrent pain well localized to the fourth interspace, to the right of the sternum. An ECG had inverted T waves in leads 1, 2, and V6.

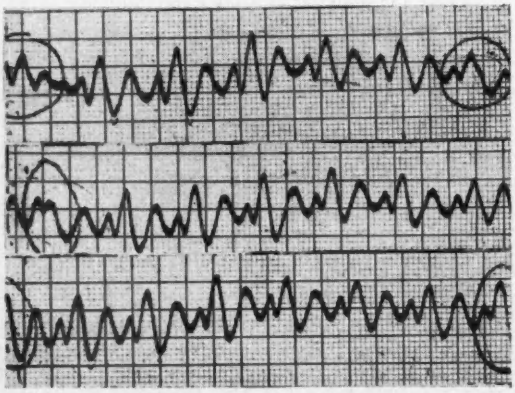

Figure 3.—A 30-year-old man with chronic anxiety reaction who had occasional pain simulating angina but precipitated by emotion and not by exercise. Note wide fluctuations of blood pressure indicating labile vasomotor system.

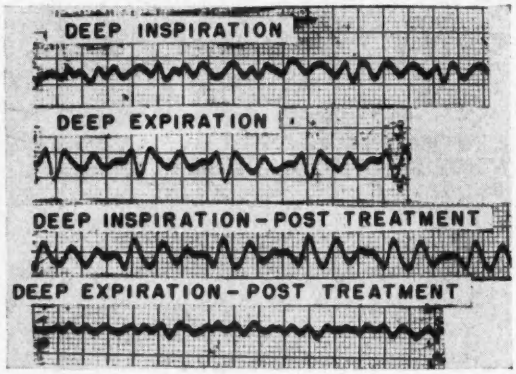

Figure 4.—A 52-year-old man with hypothyroidism, anasarca and pericardial effusion.

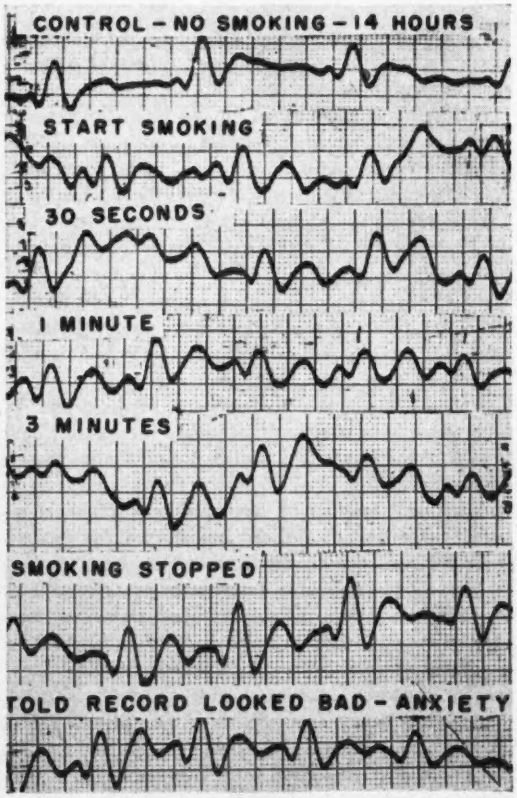

Figure 5.—A 32-year-old man who upon smoking had cold, moist palms and soles, palpitations, chest pain and, rarely, dizziness.

Illustrating Changes Clinical Conditions

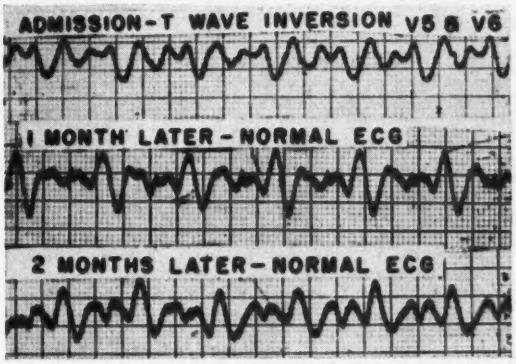

Figure 6.—A 30-year-old man in whom periarteritis nodosa was diagnosed on autopsy. No record was made in the month before death.

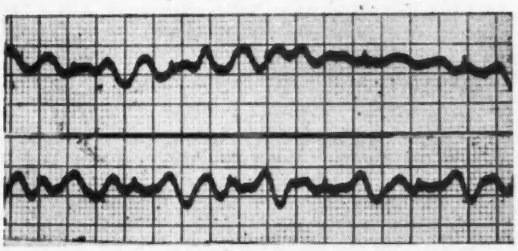

Figure 7.—A 35-year-old man with acute rheumatic carditis. The PR interval in the ECG was longer than normal.

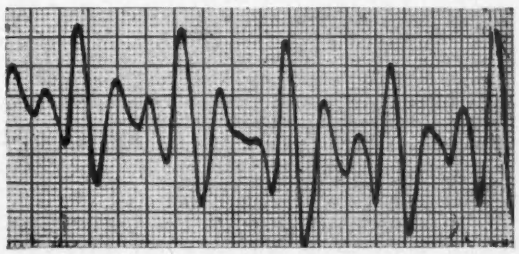

Figure 8.—A 47-year-old Chinese male with luetic aortic insufficiency in mild decompensation.

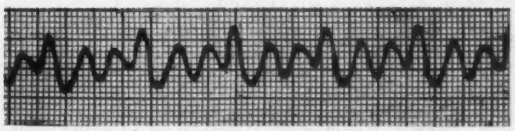

Figure 9.—A 29-year-old male with severe thyrotoxicosis and moderate cardiac decompensation. The cardiac output as measured by the Evans blue dye dilution method was 7 liters per minute.

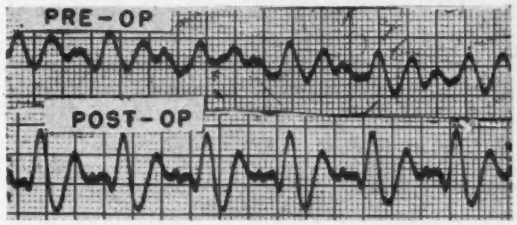

Figure 10.—A 36-year-old Mexican male with constrictive pericarditis.

Figure 11.—A 59-year-old male with hypertension and mild decompensation. An ECG indicated enlargement of the left ventricle.

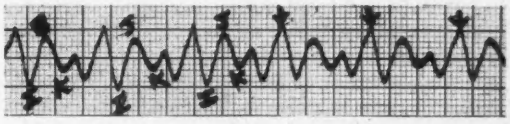

Figure 12.—A 57-year-old male in whom autopsy disclosed atherosclerosis of the abdominal aorta with thrombotic occlusion at the iliac bifurcation.

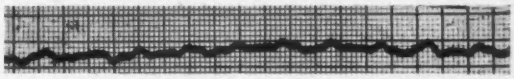

Figure 13.—A 45-year-old male with blood pressure of 160 mm. of mercury on systole and 90 mm. on diastole and with initial symptoms of vertigo and vomiting. Spinal fluid protein content was high. A diagnosis of arteriosclerotic brain disease was considered. The patient had had no angina and no abnormal findings were observed in an ordinary electrocardiogram or by the Master method.

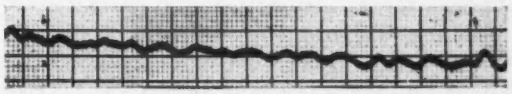

Figure 14.—A 35-year-old man with acute dyspnea and sweats but no discomfort in chest. There was evidence of neurotic tendencies. An inverted T wave in the V4 position was observed in the first electrocardiogram made, but subsequent tracings showed only normal patterns.

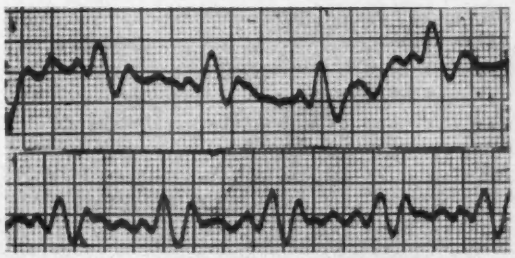

Figure 15.—A 41-year-old man in whom acute pain in the anterior chest began two weeks after an upper respiratory infection and was accentuated on inspiration. Low fever and increase in sedimentation rate were noted. No friction could be heard in the chest, and electrocardiographic findings were normal.

tricular systole can be gained from a study of IJ amplitude.

In cardiac failure at low output the ballistocardiographic waves are small and distorted. In failure at high output, however, they may be normal or increased in amplitude, while all the signs of myocardial failure are present. Shown in Figure 8 is a record on a case of aortic insufficiency and in Figure 9 on a case of thyrotoxic heart disease. In the latter case the minute output was determined by the dye dilution technique to be 7.2 liters. Figure 10 shows the effect on the waves of pericardiectomy in a case of constrictive pericarditis.

4. *K wave abnormalities—aortic obstructions and hypertension.*

The K wave can be used to detect increase or decrease of pressure in the aorta and in the vessels of the leg. Hypertension characteristically causes deep K waves. Hypertension with hypertensive heart disease causes deep K waves in combination with a small IJ wave (Figure 11).[17]

Shallow K waves may occur in peripheral arteriosclerosis and in occlusive disease of the aorta itself.[14] It would be expected that coarctation would have this effect; in the one case of coarctation studied in the series, however, the K wave was not shallow, presumably because the patient, a 60-year-old man whose feet were warm and foot pulses palpable, had developed a large collateral circulation.

In Figure 12 there is a small K wave recorded on a patient who at postmortem examination was found to have thrombotic occlusion of the aorta at the iliac bifurcation.

5. *Coronary artery disease—total loss of normal pattern.*

The most important use of the ballistocardiogram is in the detection and perhaps in the prognostication of coronary artery disease.[20] Taymor[21] and others have indicated how the electrocardiogram and the ballistocardiogram are complementary in the diagnosis of angina pectoris. In Figure 13 is the very abnormal record of a man who probably had coronary artery disease, although he had no symptoms of heart disease and electrocardiograms made at rest and after exercise disclosed no abnormality.

Figure 14 is a tracing on a young male who had attacks of dyspnea and sweating, without pain. He was a nervous person. Electrocardiographic findings were within normal limits, but pronounced abnormalities in the ballistocardiogram were strongly suggestive of organic heart disease.

The ballistocardiogram may also be of great help in ruling out suspected coronary disease. Figure 15 represents a case of acute benign pericarditis in a man in whom, because of his age and symptoms, a diagnosis of myocardial infarction had been considered. The normality of the ballistocardiographic tracings supported the diagnosis of benign disease, since in 95 per cent of cases of myocardial infarcts abnormality can be detected in tracings made over a period of several weeks.[21]

1245 Glendon Avenue.

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The Use of Silicones to Protect the Skin

GRANT MORROW, M.D., San Francisco

• *Silicote® ointment was used as a protective covering for the skin in the treatment of 107 patients with various kinds of dermatologic disease. In 83 the disease was cured or effectively controlled. It was particularly effective in conditions caused or aggravated by water-soluble or oil-soluble irritants.*

AN OINTMENT CONTAINING silicone fluid which forms a protective coating on the skin was used in the treatment of 107 patients with various dermatologic conditions.

The silicone fluids, known chemically as dimethylsiloxane polymers,[3] meet a need, long felt by dermatologists, for a preparation that can be used topically as a safe and effective protection against common irritants such as soaps, detergents, industrial chemicals and other allergens. They are inert, nontoxic, non-absorbable, non-sensitizing, adherent and water repellent; and they are invisible on the skin, do not interfere with tactile sensations and do not occlude perspiration.

In the present study the silicone used in the ointment was one that is known commercially as Dow-Corning 200 silicone fluid.[2] Barondes and co-workers,[1] in experiments with rats, noted that application of the fluid had no adverse effect on growth, mortality, appearance, behavior, blood or tissue. The fluids are non-sensitizing.[4] Talbot, MacGregor and Crowe,[6] who made the first report on clinical use of the substance, stated that applications of Silicote,® an ointment composed of 30 per cent Dow-Corning 200 silicone in U.S.P. petrolatum album, were effective in the management of 58 of 61 cases of various dermatologic conditions, including diaper rash, cutaneous irritation at the site of colostomy, intertrigo, decubitus ulcers and others in which protection from moisture was desirable.

The various kinds of dermatosis treated in the present series, the number of patients with each kind and the results are shown in Table 1.

Presented before the Section on Dermatology and Syphilology at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

PRESENT STUDY

The patients, most of whom had been treated previously by conventional methods without benefit, were instructed to apply Silicote ointment to the affected areas of skin four times daily and to wipe off the excess with a moist towel. Cure or satisfactory control was obtained by 83 of the 107 patients (Table 1), the skin usually clearing in one to three weeks after use of the ointment was begun. The protective ointment was particularly effective in control of diseases caused by water-soluble and oil-soluble irritants.

DISCUSSION

Silicote ointment has no curative power. It simply protects the skin and permits healing to progress. Patients in the present series were instructed not to use the ointment constantly once healing had occurred, but to apply it only before they were to come into contact with offending agents. Many of the patients, having the protection of Silicote, were able to discontinue wearing cotton-lined rubber gloves and to omit other precautionary measures that formerly were more or less routinely prescribed in the management of the diseases they had.

TABLE 1.—*Results of use of Silicote as protective coating over affected areas in treatment of various kinds of dermatitis*

Type of Case	Number Patients	Cured or Satisfactorily Controlled	Not Relieved
1. Dermatitis venenata of the hands			
a) Housewives, bartenders, laboratory workers, dishwashers, beauty operators and nurses sensitive to soaps, detergents, plants, dyes, tints and chemicals	69	66	3
b) Locomotive firemen and engineers—diesel oil dermatitis	9	0	9
2. Circumscribed neurodermatitis*—perianal, arms and legs	23	13	10
3. Atopic dermatitis of the face, arms and legs—sensitivity to wool, starch, soaps	4	3	1
4. Nummular eczema of the hands	2	1	1
	107	83	24

*Actually contact dermatitis with secondary lichenification.

As Silicote causes temporary burning sensation in the eyes if it comes in contact with them, it should not be applied to the eyelids.[5] The ointment should not be applied to "weeping" areas of skin. In such conditions conventional treatment should be carried out and Silicote used only to prevent recurrence.

The silicone fluids were first compounded in water-dispersible bases, but the film appplied to the skin by use of such preparations peeled off too easily to give adequate protection.

An indication of the integrity of the protective coating formed by Silicote was the observation that to remove it from the skin required three or four scrubbings with soap and water.

Sensitivity to Silicote did not develop in any patient in a period of more than a year of observation.

909 Hyde Street.

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Three New Members on Legislative Committee

THE BOARD OF TRUSTEES of the American Medical Association recently appointed three new members to the A.M.A. Legislative Committee. They are: Drs. R. B. Chrisman, Miami; Harlan English, Danville, Ill., and John E. McDonald, Tulsa, Okla.

The board accepted with regret the resignations of Dr. F. J. L. Blasingame, who has been serving as chairman of the committee, and Dr. Julian Price, who has been serving as a member. Both said that the pressure of other commitments, along with their work as members of the Board of Trustees, made it impossible for them to serve any longer.

The committee later elected Dr. David B. Allman, Atlantic City, a member of the board, as its chairman.

Besides Drs. Allman, Chrisman, English and McDonald, the other members of the Legislative Committee, which was first appointed by the board in 1949 at the direction of the House of Delegates, are:

Drs. Clark Bailey, Harlan, Ky.; J. Lafe Ludwig, Los Angeles; J. D. McCarthy, Omaha; Chauncey L. Palmer, Pittsburgh, Pa.; McKinnie L. Phelps, Denver; Deering G. Smith, Nashua, N. H., and Mr. C. Joseph Stetler, Chicago, secretary.

The committee is working out plans to hold a number of regional meetings throughout the country.

—The A.M.A. Secretary's Letter

Paternal Domination as a Cause of Somnambulism

B. I. KAHN, Cmdr., MC, USN, San Francisco, and
R. L. JORDAN, Lt. (j.g.), MC, USNR, Los Angeles

• The cases of 15 men admitted to the neuropsychiatric service of a Navy hospital for somnambulism indicate that sleepwalking is an aggressive or sexual motor activity seemingly aimed primarily at a fear-inspiring father. Although the patients varied in age from 18 to 36 years and in rank from seaman to chief petty officer, eight being married and seven single, all were from small-town or rural homes in the low economic class. Their training was religious and strict. They professed great respect for their fathers, to the extent that they could not criticize them or acknowledge hostility toward them. Their relations with their mothers were in general not satisfactory.

Apparently fear of the father and the inability to express resentment or aggression was applied to all situations so that the suppressed feelings could be released only in sleepwalking, nightmares and fantasies. These abnormalities, by making the patients conspicuous, increased their terror and anxiety.

It is emphasized that sleepwalking activities, far from being harmless, may endanger the patient or those about him.

Long-term psychotherapy is necessary for the disorders manifested by somnambulism.

SOMNAMBULISM IS FREQUENTLY considered a minor extension of a psychoneurotic syndrome.[5] Often the patient is either too ashamed of his behavior to discuss it in therapy, accepting it as an evil habit to be regarded somewhat like masturbation, or he attempts to ignore it because he is dissuaded from seeking therapy by the jeers of his parents. Some somnambulists do not understand their condition to be a medical problem and do not know where to turn. In many cases when a physician is consulted, he encourages the patient to forget—perhaps to marry—or prescribes sedatives and gives assurance that in time the symptom will be outgrown.

In the armed forces there is, of course, considerably greater opportunity for the recognition of the condition, although the patient is faced with the same problem as in civilian life. The men about him may consider his nocturnal activity with indulgent amusement, referring to him as the comedian in their midst, or they may react with considerable anxiety to having a "queer" person in their midst. Not infrequently when the condition is reported, the medical officer consulted may consider the symptom not worthy of further investigation.

Legend and folklore present sleepwalking as an innocuous nocturnal exercise. The sleepwalker appears as an amusing figure in plays and movies, often with a thinly oriented sexual motivation. However, like most folklore, such interpretation is an ironic distortion of facts. The significance of the symptom cannot be ignored or ridiculed. Sandler[6] stated, "Somnambulism represents a direct threat to the sleepwalking soldier, for during his nocturnal perambulations he may injure himself or be shot because of failure to halt at the guard's command."

The indifference which stems from ignorance of the symptoms seemingly encourages the somnambulist to attempt to accept his disorder with complacency; but this attitude was not easy for the patients whose cases are here presented; they exhibited a tremendous amount of anxiety and were constantly fearful they would do bodily harm to themselves or others while walking in their sleep. They recognized their ineffectuality in their assignments and were chiefly concerned about what might happen to them while they were asleep.

The material for this presentation was obtained from the study of 15 men who were admitted to the neuropsychiatric service of the U. S. Naval Hospital, Oakland, with "sleepwalking" as the chief complaint or as the secondary complaint incidental to a neuropsychiatric diagnosis. The data amplified herein were obtained from personal interviews with the patients and with their friends and relatives, and from psychologic tests. The purpose of the study was twofold: To determine what personality patterns, character profiles, and family constellations were common to the patients, and to evaluate

From the Neuropsychiatric Service, United States Naval Hospital, Oakland.

The opinions expressed are those of the authors, and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Presented before the Section on Psychiatry and Neurology at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

the dangers of sleepwalking, both to the patient and to those about him. The results of this study are sufficiently uniform and consistent to be considered valid and reliable data with respect to the background and personality resulting in somnambulism.

The patients included in the study varied in age from 18 to 36 years; they had been in the Navy from 3 months to 16 years. Their ratings ranged from seaman to chief petty officer. Of the 8 married men, 6 were over 25 years of age; of the 7 single men, only 1 was 25 years old. They came predominantly from farms or small towns in the Midwest or the South; all had been reared in the American culture so well typified in "Smalltown," and were in the low but not the lowest economic groups.

The similarity of family background brought out in the study appears to result from certain parental characteristics. In each case the members of the patient's family were all regular churchgoers. Five patients were Baptists, 2 were members of the Church of God, 1 a Seventh Day Adventist, 1 a member of the Pentecostal Church, 1 was a Roman Catholic, and 2 were from families in which one parent was Roman Catholic and the other Protestant. Three did not express religious preferences other than Protestant.

Of the 15 patients observed, 13 were admitted to the neuropsychiatric service for observation because of disturbing nightmares and, in most cases, sleepwalking. All reported lifelong somnambulism. The frequency of their nocturnal walking varied from once in several years to three or four times weekly. The frequency for each individual was found to be constant in spite of changes in situation. The general environment had little to do with their activity, but all admitted sleepwalking was a manifestation of their anxiety about emotions experienced in connection with anger-inciting events about which they could not bring themselves to express overt hostility during the day. One of the patients could predict that he would walk in his sleep if he became emotionally upset during the day.

Somnambulism is the symptom of dissociated mass motor activity, not necessarily walking (one patient was crawling on hands and knees toward the rim of a deck when he was awakened by striking his head against a stanchion). The literature on the nature of this expression of neurosis is limited. Menninger[4] discussed similarities between sleepwalking and the unrealistic behavior of certain types of patients and indicated sleepwalkers do not ever become schizophrenic. Fenichel[2] suggested that sleepwalking expresses motor restlessness in consequence of unreleased internal tension developing through the day. Sandler[6] in his monograph accepted essentially the same mechanism. Abraham[1] stated the somnambulist converts his fantasies into more or less complicated actions which he cannot recall on awakening. Jones[3] stated that the purpose in sleepwalking is disguised. None of these observers has brought out the relationship of sleepwalking to the manifest content of dreams, which in the series here reported was so striking. Most of the patients studied described at some length dreams connected with snakes. The sexual symbolism woven around dreams of snakes is by now too well known for repetition.

The study revealed a striking similarity in the personalities of the patients. Although their perceptive powers were better than average, their intellectual faculties normal or above average, and their memories intact, verbalization of difficulties with respect to feelings concerning their thoughts was all but impossible. These difficulties, in general, revolved around a distorted relationship with their fathers. They spoke with apprehensive reluctance of their wives, expressing deep concern for their cloudy future, feeling indecently stigmatized by such an obscure psychological defect—judging themselves as they thought others judged them. They were highly voluble about the opinion of others with respect to themselves. Emotionally somewhat naive, labile and immature, under a considerable degree of tension and with only a minimal tolerance to anxiety, they tearfully expressed an inability to externalize their deeper emotions. Frightened at their role in the world and inhibited in all personal relationships, they lived in fear of each approaching night. One patient, in a childish attempt to gain approval from shipmates, described his somnambulism with a pathetic histrionic pride.

The chief identification figure of these men was an authoritarian father, to whom they reacted by an inordinate drive for success to emulate or perhaps to surpass him. They felt hostility about what they considered indifference to them of maternal figures. All revealed that sexual and aggressive impulses were severely repressed. It was difficult for them to have any type of long-term sexual relationship or to express anger at superiors. Their interpersonal relationships were highly ambivalent and tinged with anxiety. When sudden situations developed aboard ship, at home, or in community life, which they had made no plans for handling, they verged on panic. The normal tension-relieving devices on which most people lean were replaced in these patients only by rich fantasy in which they were authoritarian figures who could express resentment and aggression without fear of retaliation.

While aboard ship, because the patients could not indulge in the expression of anger, resentment or hostility, they became more and more anxious; as the normal tensions incidental to the day's activity mounted, their relieving devices instead of being acted out in a meaningful manner were utilized pre-

dominantly at night in motor activity. Another factor increasing their anxiety was the concomitant fear of each approaching night. They did not know what their nocturnal activities might lead them to do.

Physical examination, electroencephalography and all other tests to rule out organic or metabolic factors as an etiologic element disclosed no abnormality in any of the patients.

To understand the sleepwalker adequately, it is essential to understand his family. Attention has been called to the similarity of family background in the patients. Significantly, there was not a divorce or separation among the parents of any of the sleepwalkers studied in this series. The only second marriage occurred following the death of a spouse.

The patients described their fathers in almost lyrical terms comparable to extracts from Father's Day cards: "The best dad a boy could have," "the perfect father," "a swell pal," etc. The fathers were unusually stable in occupation (several had retired after long years of service in the employment of only one company); they were considered honest and reliable men, well thought of in the community, the type of father a son could emulate. Even to speak disparagingly of such fathers seemed to the patients positively sinful. Frequently the fathers were officials in the church, or at least well known and regular churchgoers. The relationship between the patients and their fathers was, according to American cultural standards, of the type regarded as most conducive to inculcating paternalistic ideals into the sons. This relationship, however, appears unrealistic, for while an authoritarian figure may be respected or admired, it is difficult to love wholeheartedly when subjected to harsh, reproving measures and stern unyielding discipline.

Sandler[6] pointed out this identical pattern, stating: "The fathers in the entire group were feared, respected and idolized; the soldiers painted a consistently rosy picture of their fathers. Some of the 22 men were so emotionally attached to their fathers that they had selected the same vocations and expressed considerable satisfaction at having worked with their fathers. In contrast to the fathers, 17 of the mothers were placed in the inferior category . . ." In this series, the mothers were described as being submissive to their husbands, frequently nervous, sickly; and while several did report a rather punitive mother, it is significant that few of the patients had a really close relationship with the mother. None of them spoke of her with the tenderness exemplified in American culture. American culture at present tends to relegate the father to a submissive role and make the mother the authoritarian family figure. This would seem to indicate that in the family of the sleepwalker there is a pathologic distortion of what should be "normal" American standards. The seniority of the patients in their families was not significantly consistent; they ranged from the older of two children to the youngest of ten. The relationship of the patient to his siblings would bear further study in this connection.

When patients were able to express their feelings, they did show some affective lightening of tension; nonetheless, it is the opinion of the authors that psychotherapy for somnambulism must be on a long-term basis and is not suitable for the naval service. The history of long-term psychological maladjustment, stemming from fear of retribution and inadequate resolution of oedipal conflicts, growing more severe from early childhood, would in itself suggest a poor prognosis.

The data in this study indicate the somnambulist is, in general, infantile, naive, emotionally labile, impulsive, moderately histrionic and egocentric. He is constantly fearful of tension which has reached proportions so severe as to induce a nocturnal type of acting out of aggressive or sexual impulses the admission of which is too frightening for him to contemplate. This exaggerated tension stems from childhood repression of hostility to the parental figure. Overtly, the patient wishes to emulate a strong father, who looms to him as a large and threatening male figure. Concomitantly, there is a feeling of being abandoned by a timid, indifferent, and/or ineffectual mother. The parental roles are pathologically restricted and aggressive impulses are of such intensity as to result in an emotional trauma of lifelong duration. The maternal functions of solicitude, interest, support and protection are apparently lacking because—or so the patients implied—the mother is also terrified by her stern husband. The emulation arises from fear and requires the child to create for himself a restrictive pattern which is all-pervasive; an ineffectual effort to protect him from his own fear of retribution.

To this repression the patient reacts by acting out in a dream world the distorted fantasies he has about all authoritarian figures (fathers, officers, stern superiors) which culminate in night walking.

Sleepwalking, therefore, is an aggressive or sexual motor activity seemingly aimed primarily at a fear-inspiring father.

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The Maternal Welfare Committee of San Diego

An Educational Function to Save the Lives of Mothers and Babies

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• A maternal welfare committee was founded in 1947 by representatives of nine hospitals in San Diego County, with the purpose of inquiring into all deaths involving maternity in order to reduce maternal mortality. At open meetings cases of such death are reviewed and a vote is taken on whether the death was preventable. Deaths of newborn children are also investigated for preventable factors.

From 1947 to 1952 the maternal mortality rate has declined among residents of the county from 7.3 per ten thousand live births to 2.7. It is believed that the emphasis placed on high standards of prenatal and postpartum care by the committee's observations has greatly aided in securing this improvement.

FOR SOME YEARS we have had in this country stimulating and provocative reports from various maternal mortality (often termed maternal welfare) committees.[3,4,6,7,8] Starting with the Philadelphia group in the early thirties, these committees have done much to teach medical students, general practitioners and specialists.[1, 11] They have searched into the causes of obstetrical deaths, pointing out deficiencies on the part of the patient, the physician and/or the hospital.[5] They have discussed preventability, and have done much to improve standards of obstetric practice. In later years, as maternal mortality was lessening, these committees began in some localities to analyze fetal deaths and to discuss the problem of premature birth. The idea spread rapidly. The work of such groups is an important facet in the reduction of maternal and fetal mortality.

In 1947 a similar maternal welfare committee was organized in San Diego through the stimulus of a physician in private practice and another in the San Diego Health Department. The founding members were nine physicians, representing nine hospitals in San Diego County, who stated their purpose to cooperate with the city and county health departments on all problems of maternal and infant health, and to seek ways and means of improving the practice of obstetrics and infant care in the county. There was no medical school in the locality and the committee had no special monies or grants.

San Diego County has a population of about 630,000 with 434,000 living in the city. There is a large military population and quite a shifting civilian population. The county and town are rapidly growing, as is the medical society. Half of the physicians have arrived since World War II. About 35 specialists form the obstetrical and gynecological society.

From the year 1947 through 1950 there were approximately 14,000 live births per year in the county; this figure jumped to 16,000 in 1951 and to 20,745 in 1952. Of all these live births approximately 2,400 were "non-resident" (that is, the mothers resided out of the county), and 40 per cent took place in military hospitals under the care of Navy physicians. In 1952, 99.4 per cent of deliveries took place in hospitals.

The San Diego Maternal and Neonatal Welfare Committee has held regular meetings and has discussed every death due to childbirth since 1947. In later years the members have expressed an opinion as to whether each death was preventable or non-preventable. During the six years of its existence the committee has accomplished the following:

a. Obtained the endorsement of the San Diego Gynecological Society, the San Diego Pediatric Society and the San Diego County Medical Society.

b. Formulated a Maternal Mortality Questionnaire patterned after the one used by the Philadelphia committee.

c. Educated the physicians of San Diego County relative to its purposes and methods of operation.

d. Very successfully stimulated and educated the nurses of obstetrical departments and nurseries. This group has been most eager to learn, to improve standards of care, and to cooperate with the the physicians. In April 1948 the nurses, realizing that their problems were somewhat different from those of the physicians, organized their own subdivision, known as "the branch." Two chosen representatives of the branch attend the physicians' meetings, take notes, and make reports to their own members. The phy-

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sicians in turn have a counselor to attend the branch meetings. The nurses have held regular meetings, elected their own officers and conducted their own programs. Their attendance has been good and each hospital of San Diego County is usually represented at their meetings. They have discussed a great number of obstetric and nursery problems and procedures. They have developed a manual on standardization of nursing methods and techniques. Many of their discussions and ideas have borne fruit.

e. Suggested standards for hospital consultations in obstetrics and encouraged early consultation.

f. Formed, in 1949, a committee which has reviewed the birth and death certificates in all neonatal deaths in which the infant weighed over 1,500 gm. A neonatal questionnaire has been formulated to be sent to the attending physician in each case in which the committee feels death was possibly preventable or in which there were features that could be instructive.

g. Discussed cases in which the mothers were critically ill but survived.

Meetings are held four to six times annually. To increase attendance and to acquaint more physicians with the program, meetings are rotated through the various hospitals of the county. They are held in lieu of regular hospital staff meetings.

A questionnaire is sent to the attending physician or physicians on each maternal or fetal death that is to be investigated. An effort is made to assemble the case history immediately upon report of the death by the Health Department. The physicians concerned with the case are notified as to the date of presentation. Pediatricians and all physicians practicing obstetrics in the county are invited to attend, including osteopathic physicians and surgeons, who operate one hospital in the city. The case history is presented by the presiding officer without mention of names, and constructive discussion from the floor is encouraged. A vote is taken as to whether the death was preventable. If the death is deemed to have been preventable, a letter is written to the hospital concerned and a request made that the case be further discussed at the staff meeting. The Health Department has been very generous in supplying a recorder and has accomplished administrative details.

Over a six-year period maternal deaths among residents in San Diego County numbered as follows (with rate per ten thousand live births):

	1947	1948	1949	1950	1951	1952
Deaths	10	10	7	6	7	5
Rate	7.3	7.5	5.0	4.3	4.4	2.7

Since good prenatal care is so important in obstetrics, deaths of non-residents are more correctly attributed, in such reporting, to the county of residence. There were one such death in the county in 1948, two in 1951 and one in 1952. Aside from statistical considerations, a maternal welfare committee should recognize and inquire into deaths of non-residents.

TABLE 1.—*Causes of all maternal deaths in San Diego County, 1947-1952*

Cause	No. of Cases
Septic abortion	3
Ectopic pregnancy	2
Toxemia:	
Preeclampsia	4
Eclampsia	9
Other toxemias	3
Postpartum hemorrhage	13
Ruptured uterus	1
Blood transfusion reaction	1
Cardiac complication	7
Anaphylactic drug reaction	1
Pulmonary embolism	4
Anesthesia	2
Shock and hemorrhage:	
Podalic version and dystocia	1
Forceps delivery with hematoma and infection	1
Postpartum shock and anemia	1
Pneumonia	1
Cancer (melanoma)	1
	55

The causes of all maternal deaths for the same years are shown in Table 1. It should be noted that toxemia and hemorrhage are the most important causes. Infection, third in importance, is also an accessory factor in deaths from other primary causes, with heart disease a close fourth.

It must be remembered that according to the manual of the International Classification of Diseases, Injuries and Causes of Death, only deaths certified as due primarily to obstetrical complications are attributed to this cause. The error which may arise from this limitation is exemplified by the deaths in 1952 of two women with heart disease, both of whom were delivered near term, one by cesarean section. For statistical purposes the deaths were considered due to heart disease. To consider such cases, a maternal welfare committee must have information about all women who have been pregnant within three months of death. A better means than the certificate of death should be found for learning of such cases.

In addition to the two deaths mentioned for 1952, there were five other deaths of pregnant women which were not attributed to maternity. In all five cases the patients died undelivered. The causes of death and the duration of pregnancy in these cases were: anterior bulbar poliomyelitis (6 months); hemorrhage, esophageal varices, cirrhosis of liver (6 months); acute gangrenous endometritis with hemorrhage (first trimester); acute coronary thrombosis (5 months); intrapericardial hemorrhage (5½ months). It is probable that the death due to endo-

metritis should also have been considered a maternal death. Nevertheless, the total of 13 maternal deaths from all causes, including that of a non-resident, should be considered against the total of 21,030 live births, a rate of less than 1 in 1,600.

No progress has been made, however, in reducing the neonatal death rate, a problem which constitutes the next great challenge in obstetrics, and which requires intensive study. Sixty-four per cent of all neonatal deaths are among premature infants. The death rates for resident newborn children (less than one month of age) for six years were as follows:

	1947	1948	1949	1950	1951	1952
Live births	13,771	13,302	13,890	13,838	15,816	18,401
Deaths	238	276	286	273	293	377
Rate per thousand	20.6	20.7	20.6	19.7	18.5	20.5

CONCLUSIONS

It is the author's opinion that a maternal and neonatal welfare committee as described here is a very beneficial organization. The mere investigation of a maternal or neonatal death and the discussion of it before a welfare committee has the salutary effect of making physicians doing obstetrics more conscious of abnormalities which may cause maternal or fetal death. Knowing that someone is seriously interested and that each case will be reviewed will lead to earlier consultations and more adequate care. Further, such reviews offer the most practical and most impressive method of teaching interns, residents and practicing physicians. This valuable material should not be restricted to individual hospital staffs.

As the problem of neonatal and maternal care is not limited to the physician who delivers the patient but concerns also the biostatisticians, nutritionists, social workers, public health nurses, the health department, hospitals and the general public, a maternal welfare committee can function more efficiently and with greater effect than can separate workers.

One of the most desirable features is the cooperation and better understanding between physicians in private practice and the health department. In 1952 the State of California held two large meetings on the causes of prematurity,[9] the first such meetings sponsored by a health department and significant as representing a new interest by health departments in the problem of prematurity. Another example of this interest is "The Prevention of Needless Neonatal Deaths" by Bundesen, Potter and co-workers.[2]

After studying the case reports on mothers who have died in San Diego County in the past six years, the author believes that much additional progress can be made. The maternal mortality rate can be further reduced if strict attention is given to details. Items for consideration are:

1. Prenatal care can be improved. This often involves problems of patient finances and education, sometimes of transportation and of legal residence and eligibility for care in county hospitals.

2. Facilities for good neonatal care, especially for premature babies, are lacking in many hospitals. Standards, techniques and equipment must be improved.

3. Obstetrical and pediatric consultation in many cases should be requested earlier.

4. Blood must be made available on an emergency basis for every delivery. Cross-matching and provision for transportation must be arranged beforehand. (Recently a death due to placenta previa with postpartum hemorrhage occurred in a well-equipped, modern hospital and under the attendance of well-trained and competent physicians. Unfortunately delivery occurred at a time when no blood was immediately available.)

It is suggested that every county, or groups of counties, organize a maternal welfare committee. It would be a most progressive step to study carefully and present for constructive and educational purposes every case of maternal death.

As most babies are delivered by physicians in general practice, general practitioners must bear their share of responsibility for organizing and serving on such committees. By using all the improved techniques, medications, facilities and knowledge of modern obstetrics the present maternal mortality rate in California can be decreased by 25 per cent. A maternal welfare committee is a powerful stimulus to achievement of this objective.

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Industrial Dermatologic Problems

Interrelationships Between Physician, Patient, Employer and Insurance Carrier

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• Dermatologists, employers, insurance carriers and patients often flounder in misunderstanding when dealing with industrial dermatosis. A large part of such misunderstanding stems from too limited a knowledge of compensation insurance law by physicians, employee-patients and many employers. Physicians dealing with industrial cases should not only familiarize themselves with compensation law and insurance practices, but take it upon themselves to interpret such considerations to their employee-patients and, where necessary, to their patients' employers. Present-day employer-employee relationships are frequently on a most impersonal basis, and great mutual benefit will accrue to all parties when the position and objectives of each are understood by the others and the provisions and limitations of the law are known to all. The dermatologist handling industrial cases must take the responsibility of bringing this about.

THIS "ETERNAL QUADRANGLE" — the interrelationships between physician, patient, employer and insurance carrier — in which a dermatologist finds himself when he undertakes the treatment of a patient with a skin disease caused by the nature of his job, is packed with potential misunderstandings and ill feelings. In the first place, a dermatologist is all too likely to look upon a case of industrial dermatosis as one in which he will have a disgruntled patient to take care of, at least one detailed report to render, and probably a controversy with the employer and/or insurance carrier. Then, to cap the climax, he will be paid on the basis of a fee schedule which is thrust upon him and is considerably lower than his regular schedule. He may even develop a blind spot for the diagnosis of industrial dermatosis and, consciously or unconsciously, seek to justify some other diagnosis. This self-deception is always unfortunate and futile, for when the true nature of the case at last is recognized, as it must be in intellectual honesty, the situation is much more complicated and troublesome than it would have been had the nature of the case been recognized at the outset.

A dermatologist may find in his patient not only a dermatologic problem but a person who wants to blame all his troubles on his job and to ascribe all the hazards of it to faults of his employer. Such a patient may be determined to see that he gets all that is coming to him from the insurance carrier; he may proclaim that his union representative has warned him to beware of sharp practices in cases of industrial illness and let it be known he is ready to demand his rights. If he was sent to the dermatologist by his employer or the insurance carrier, he may look upon the dermatologist as a minion of the money-eyed interests who is certain to be prejudiced in their favor.

On the other hand the employer, or the employer's representative in employee relationships, may be a person who is loath to believe that the employee's dermatosis is caused by his work ("none of the other workers have it"); or one who thinks it is the fault of the employee for not having been more careful. Often a small employer carries workingman's compensation insurance only because he is compelled to do so by law and he rarely understands the first principles of it in theory or practice. He may be anxious to replace a disabled employee immediately rather than await his recovery, especially if it appears that the employee will have to have special protection or be transferred to a different type of work.

A dermatologist's dealings with insurance carriers depend a great deal upon his own approach to them. If in his first contact with them he is prompt, factual and frank, he will probably find them eager to cooperate; if he delays unduly in making an initial report, bases his opinion too much upon conjecture and implies that he knows more about the situation than he does, he may find them a little skeptical and inclined to deny liability or to transfer the patient to someone in whom they have confidence.

A great deal of misunderstanding and distrust can be obviated if the dermatologist disciplines himself properly and takes the responsibility of being a

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sort of self-appointed coordinator. He gets no extra pay for this but the value of the good will of all parties concerned may be great.

In the first place the dermatologist should examine himself and decide whether or not he will accept "industrial cases." If he does not wish to do so, he should steadfastly refuse all that are referred to him as such; and when he suspects an occupational element in the case of any patient already under his care, he should squarely face the possibility, promptly try to prove or disprove it and, if it is established that an "industrial" etiologic factor is present, refer the patient elsewhere. He will be paid at industrial rates for his services up to that point, even though he did not recognize the occupational element when he first undertook the care of the patient. But if he is willing to accept the responsibility for the management of industrial cases, he should do so with good grace and handle the human relationship aspects of the case as well as the purely dermatological.

THE DERMATOLOGIST-EMPLOYEE (PATIENT) RELATIONSHIP

If a patient is referred to the dermatologist by the insurance carrier or the employer for diagnosis and opinion as to whether or not a disease is of occupational origin, the dermatologist should limit his activities to diagnosis; if he initiates treatment without authorization, he has committed the insurance carrier for responsibility. Unless an emergency exists, he should explain to the patient that the present problem is one of diagnosis only, to determine whether and to what extent the dermatosis is due to the nature of the patient's work. In actual practice, however, palliative treatment is usually given while the diagnosis is being established, and if the dermatosis proves to be non-industrial, what to do and what not to do may be implied; if the dermatosis proves to be industrial, authorization to treat should be obtained by telephone, without delay.

The patient is often inclined to blame any dermatosis on his work and he may be militantly of that opinion until certain points are made clear to him. He should be reminded that his prime objective is to get well, regardless of the cause of his trouble; if it were erroneously decided that his trouble is due to his work, and if he were treated on that basis, the treatment probably would be ineffective. It may be pointed out to him that unbiased, perfectly objective efforts toward accurate diagnosis are therefore of primary interest to him. Attention should be called to the possibility that, should the disease be related to his work, the patient might have to change to an entirely different kind of work, and that therefore he might better hope that the dermal condition is not of industrial origin.

Most employees and many employers and physicians do not know that an employee is not paid compensation for the first week of idleness owing to an industrial illness, and that when he is paid he receives only 60 to 65 per cent of his average earnings, with a maximum usually of about $30 per week. When this is explained, it should be pointed out that this schedule is not something determined by the employer or the insurance carrier, but by the state laws. When the employee becomes aware of these facts, he is much more likely to take a relatively unbiased view and to cooperate toward attaining a true diagnosis. Should the diagnosis prove the dermatosis to be non-industrial, the patient should be advised that he is free to seek dermatologic care wherever he wishes, but at his own expense. If he is not willing to accept the "non-industrial" diagnosis, he should be advised to consult a dermatologist of his own choosing, who, if he considers the dermatosis to be of industrial origin, will so report to the insurance carrier. The carrier may then accept the case as industrial if it wishes. If it does not, the patient still has recourse to the Industrial Accident Commission.

It must be remembered by the dermatologist and pointed out to the patient, in case of controversy, that the insurance carrier is anxious not to deny liability in any case in which subsequently it might be proved that the disease is of industrial origin, for if a diagnosis of "non-industrial" is wrong and treatment given is therefore not effective, the cost of that treatment ultimately must be borne by the insurance carrier when at last it is established that the disease is, after all, related to the patient's work.

If the dermatosis is determined to be of industrial origin, care should be taken to explain the nature of the disease to the patient. Compensation law recognizes *liability without fault*, in contrast to common law which makes *fault* or *negligence* the basis of liability. It should be pointed out to the patient that, unless actual negligence on the part of his employer can be proved, it is "nobody's fault" that he has a disease of the skin. The disease can be explained as one of the natural hazards of his occupation; and it can be pointed out that insurance against such hazards is carried by his employer, and that the provisions of that insurance are regulated by state law which, while quite impersonal, was enacted for the protection of workingmen and women.

THE DERMATOLOGIST-EMPLOYER RELATIONSHIP

The relationship of the dermatologist and the employer varies with the size of the employer. In the case of a large industrial concern, such as an air-

craft plant or automobile manufacturer, the dermatologist deals with such facilities as the safety engineering department, the compensation insurance department and the employees' welfare department, whose managers are cognizant of the nature of the occupational hazards in that particular industry and are familiar with the mechanisms which have been established to handle compensation claims. The dermatologist can get a great deal of help from these facilities, particularly from the safety engineer, whose responsibility it is to be familiar with the nature of the industrial hazards in each department and devise ways and means of protection against them.

In the case of the medium-sized and small employers, it often falls to the dermatologist not only to explain the nature of the dermatosis in question, but to interpret the provisions of the workingmen's compensation laws; many employers know less about the latter than do their employees. Not infrequently an employer, mistakenly assuming that an employee's dermatosis is of occupational origin or that the insurance he has covers whatever the employee considers to be due to his work, will send the employee to a physician with the assurance that "the insurance will take care of it." Such ill-advised or mistakenly benign employers or their representatives may even call the physician's office and assure the secretary that the physician need not worry about the bill because the patient "is fully insured." The physician must immediately unscramble this erroneous assumption and proceed to indoctrinate all concerned without delay.

The dermatologist's chief relationship with the employer, large or small, centers around devising and enforcing protective measures or arranging changes in work suitable to the dermatologic and other limitations of the employee-patient. This can sometimes be accomplished through the patient, but time can be saved and misunderstandings obviated by direct communication with the employer or department head by telephone or letter. This is time consuming but effective. If the employer does not seem to be interested in devising and enforcing protective measures, it often proves stimulating to point out to him that his compensation insurance premium rate is in part determined by the experience reflected by the compensation claims of his employees, and that a high incidence of industrial dermatosis in his plant will inevitably result in higher premiums for him to pay. As a rule, however, the employer appreciates what the dermatologist is doing or attempting to do and is eager to cooperate, especially so if he realizes the costliness of man-hours lost through illness and of inefficiency due to discomfort.

THE DERMATOLOGIST-CARRIER RELATIONSHIP

Keeping the insurance carrier informed regarding the status of any case in which it has an interest is one of the best ways for a dermatologist to maintain good relations with the carrier. As soon as a dermatosis is suspected as being of industrial origin, the name of the insurance carrier should be learned from the patient's employer, and the carrier should be contacted by telephone for authorization to make such tests as may be necessary to establish a diagnosis; or, if the diagnosis has been established as industrial, authorization to treat it should be obtained. Nothing is more unfair to the carrier than to diagnose a dermatosis as industrial, treat it as such and render a report and a bill without having given notification at the outset. If the employer sends the patient to the dermatologist, or if another physician refers him, thinking the case to be on an occupational basis, and if such a basis is not apparent to the dermatologist, he should immediately contact the carrier for authorization to establish the diagnosis; this apprises the carrier of the trend of events and establishes financial responsibility for the dermatologist's services, regardless of the diagnosis.

When the diagnosis of industrial dermatosis is established, or even if there is still doubt after preliminary investigation, a detailed report should be made to the carrier, including information on the following points, in which the carrier is primarily interested: (1) the diagnosis; (2) the facts supporting the diagnosis; (3) if the diagnosis is not definitely established, (a) why is it in doubt, (b) when can it reasonably be expected to be established and (c) how will it be established; (4) is the patient disabled, and if so, (a) how long has he been disabled and (b) how much longer can he be expected to remain disabled; (5) will he be able to return to his old job and, if so, will he have to observe special precautions; if he cannot return to the old job, in what particulars must the new job differ from the old; (6) what kind of and how much treatment is anticipated.

If progress under treatment is not as anticipated, if the patient or his employer are not cooperating or if animosities are developing, the carrier should be so informed; when the patient who has been disabled is deemed ready to return to work, or if the patient who has not been disabled is instructed to stop work, the carrier should be notified promptly so that disability payments can be handled accordingly.

Insurance carriers usually retain safety engineers for consultation in cases where the employer has no such department of his own, and when difficulties are encountered in identifying the occupational contacts at fault, or devising protective methods, the carrier should be advised to supply that service.

710 Wilshire Boulevard.

Hemoglobin: Normal Values

JOHN H. SCHAEFER, M.D., Los Angeles

• *Hematologists are not in agreement as to the "normal" amount of hemoglobin in the blood, nor is there agreement as to what amount of hemoglobin can be considered "a hemoglobin value of 100 per cent." Different hospitals base reports of hemoglobin on different standards, which obviously can be misleading.*

By biometric study of the great mass of data on hemoglobin content that has become available as a result of the blood procurement program, it should be possible to determine what "normal" values are and to provide a basis for uniformity in reporting.

FEW WELL-INFORMED PHYSICIANS will deny that the practice of reporting hemoglobin in terms of percentage of any one of several widely divergent standards of normal is illogical and misleading. Some recognized hematologists have published reports advocating that as little as 13.8 gm. of hemoglobin per 100 cc. of blood be considered the level designated *100 per cent;* others would not use the term *100 per cent* for hemoglobin content less than 17.3 gm. per 100 cc.

In an effort to learn the present status of reporting hemoglobin values, questionnaires were mailed to 44 hospitals. The hospitals selected were large, teaching, university hospitals; large government general hospitals; large, outstanding hospitals in metropolitan areas; and three outstanding hospitals in smaller communities. All are known to have laboratories directed by thoroughly competent clinical pathologists.

Thirty-three replies were received. Twenty-four replies were from hospitals in California. Obviously the hospitals in California serve a homogeneous population, are all essentially at sea level and are within an essentially common range of climate. For the sake of uniformity only, the replies from hospitals in California are used as the basis of this report (although the replies from hospitals in other states would not, if included, materially affect the data).

Of the California hospitals from which replies were received, 14 report hemoglobin both in grams per 100 cubic centimeters of blood and in percentage. Ten report only in terms of grams of hemoglobin.

The letter of transmittal which was sent with the questionnaires contained this request:

"If you do not report in terms of per cent, I would appreciate it if you would state the number of grams of hemoglobin per 100 cc. of blood you would use as 100 per cent if you did report on a percentage basis."

Three of the reporting hospitals did not answer this question.

NORM FOR REPORTING IN PER CENT

The reported basis for 100 per cent in men ranged from 14.5 to 17.2 grams with a mean of 15.3 grams. For women the basis ranged from 13.0 to 17.2 grams with a mean of 14.8 grams. Fifteen hospitals reported using the same basis for 100 per cent for both sexes.

From the foregoing it is apparent that Mrs. X, whose blood contained 13 grams of hemoglobin per 100 cubic centimeters would be reported by hospital A (13.0 gm. = 100 per cent) as having hemoglobin value of 100 per cent and would be reported by hospital B (17.2 gm. = 100 per cent) as having only 76 per cent. Conversely, Mrs. Y, whose blood contained 17.2 grams of hemoglobin per 100 cubic centimeters would be reported by hospital B as having 100 per cent hemoglobin and would be reported by hospital A as having 132 per cent hemoglobin.

NORMAL RANGE

Men

The lower limit of "normal" range in men varied from 12.0 to 15.0 grams per 100 cubic centimeters and the upper limit from 15.0 to 18.0 grams per 100 cubic centimeters. One hospital considers 15.0 grams hemoglobin per 100 cubic centimeters to be the lower limit of "normal," while another considers it to be the upper limit of "normal."

The narrowest "normal" range reported by any hospital was 15.0 to 16.0 grams. The broadest was 12.0 to 17.2 grams.

Women

The lower limit of "normal" range in women varied from 12.0 to 14.5 grams and the upper limit from 14.5 to 17.2 grams. One hospital considers 14.5 grams per 100 cc. to be the lower limit of "normal," while another considers it to be the upper limit.

The narrowest "normal" range for women reported by any hospital was 13.9 to 14.5 grams and the broadest was 12.0 to 17.2 grams.

The director of laboratories of one outstanding hospital reported in part as follows: "Hemoglobinometer standardized by averaging hemoglobin determination in five healthy male adults." The fallacy of such a standard will become apparent later in this report.

The most valuable reply was received from the consulting hematologist to one of the largest general hospitals on the West Coast. He sent data based upon a frequency curve such as is shown on page 204 of Todd & Sanford's "Clinical Diagnosis by Laboratory Methods," 11th Ed., 1948. (Sanford used a curve of this type to determine the probable error in carefully conducted erythrocyte counts. Such a curve has many other uses and is discussed in its more general applications on pages 331 and 340 of "Biomathematics" by W. M. Feldman, M.D., published by Charles Green & Co., Ltd., London, 1923.)

On the basis of such a curve the hematologist gave the normal range of hemoglobin in men as 14.0 to 16.5 grams per 100 cc., and in women as 12.5 to 16 grams.

Any biometric approach to the determination of "normal" hemoglobin values should be based upon a very large number of determinations, inasmuch as the probable error varies inversely as the square root of the number of observations. For example, if the probable error were computed on the basis of 1,000 observations and the probability seemed to be undesirably great, it would be necessary to compute the probable error on 1,000 squared—or 1,000,000—observations in order to reduce the probable error by half.

This basic mathematical principle demonstrates the fallacy of trying to establish any standard on the basis of hemoglobin values in "five healthy male adults." Only by chance can such a standard have any real value.

From operations of the blood bank program the American National Red Cross now has or should have a mass of data from which authentic hemoglobin values could be computed, for the hemoglobin content of the blood of each prospective donor is determined, and only donors who are apparently in good health are accepted.

To make a biometric analysis of these data to determine mean hemoglobin values and normal limits of hemoglobin values in each sex would be a big job, but the potential value would seem to more than justify the expense.

By this means hemoglobin values for the United States as a whole could be obtained. Of probably greater importance, hemoglobin values for geographic areas differing in climate and altitude could be determined.

Once norms were established by such means and by data on so many cases, there could no longer be any excuse for the present wide divergence of opinions as to what constitutes a "normal" hemoglobin value.

525 South Flower Street.

Lumbar Sympathectomy by Electrocoagulation

Its Use in the Management of Certain Vascular and Visceral Disorders

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• Although normally the sympathetic nerves aid vascular dilatation during effort, in certain diseases of the vascular system they have a reverse effect. Abolition of sympathetic vasoconstrictive impulses by sympathectomy is the most effective treatment in some chronic peripheral vascular conditions. The authors have used electrocoagulation for a number of years and found it quick, effective and more likely to prevent regeneration of the affected nerves.

Improvement was obtained by sympathectomy in arteriosclerotic vascular insufficiency, thromboangiitis obliterans, Raynaud's disease, reflex sympathetic dystrophy following thrombophlebitis or trauma, scleroderma, spinal sympathetic dystrophy and acquired megacolon. A case of causalgia was aggravated by the operation.

Abstention from the use of tobacco appears to be sufficient for control of symptoms in many cases.

Since vasospasm is manifested in many conditions long before a thrombotic catastrophe occurs, not only relief of symptoms but prevention of irreversible changes may be achieved by early operation.

FOR MORE THAN a quarter of a century lumbar sympathectomy has been used in the treatment of various disorders of the lower part of the body. Unfortunately, the operation has been ill-advised in some cases and the results disappointing; consequently there has grown up a reluctance to use it even in circumstances in which it is most effective. While the authors' experiences have been encouraging, it is recognized that they are relatively limited.

The operation as originally described by Royle,[13] who recommended it in treatment of spastic paraplegia, has not been changed much in essentials, but the use of it in spastic paraplegia has been abandoned. It appeared for a time that Hirschsprung's disease[1, 4, 9] could be relieved by sympathectomy, but enthusiasm over the immediate effects from the operation was short-lived. The congenital absence of nervous structures of the lower segment of the bowel in this disease is now recognized, and resection of the segment appears to offer a more favorable solution to the problem.[16, 18] The use of lumbar sympathectomy in multiple sclerosis is another short paragraph in the record of unsuccessful therapeutic measures.[6]

In the light of a better understanding of physiologic and pathologic phases of disease, the indications for sympathectomy become more clear and better results are attained. Thus, diseases with vasospasm and vascular insufficiency respond most dramatically to the operation. Likewise, the syndrome of acquired megacolon with cord bladder often responds favorably, but this condition can almost always be controlled by more conservative measures.

Under normal conditions, sympathetic impulses tend to aid vascular dilatation in the striated and cardiac muscles involved in effort. On the other hand, certain diseases of the vascular system are usually accompanied by altered or even reversed sympathetic action.[11] Therefore, sympathetic impulses generated by exercise tend in some abnormal states to cause serious interference with the supply of blood through vasospasm. In such ischemic states, degenerative changes take place and the tendency to thrombosis and gangrene is greatly increased. Arteriosclerosis, thromboangiitis obliterans, Raynaud's disease and certain chronic inflammatory disorders of the lower extremities[15, 19] are notable examples of reversed sympathetic activity. Muscular pain on effort, particularly below the knees, is usually the initial complaint. Thrombosis and gangrene are likely to occur later. Vasodilatative drugs are well known to effect some symptomatic relief, but this at best is only temporary, since the maintenance of sufficient drug concentration in the system to inhibit vasoconstrictive influences continuously is highly impractical. Further, the action of drugs is not sufficiently selective to affect only the region involved by disease, and generalized vasodilatation may even decrease the supply of blood to the diseased area.

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Although the injection of procaine hydrochloride into the lumbar sympathetic chain is commonly recommended, the drug can be expected only to reach the general vicinity of the chain, the hope being that it will pool about the chain. Quite frequently this occurs but the effects are only of short duration. While in some acute vascular lesions the procedure probably has therapeutic merit, in chronic conditions its therapeutic value is questionable and it should not be considered; it only prolongs the condition and permits further irreversible changes to take place. It is much more desirable to abolish permanently the sympathetic vasoconstrictor element. This can be accomplished effectively only by sympathectomy, after which, in properly selected cases, previously progressive symptoms usually subside and the danger of thrombosis is reduced.

The sympathetic efferent pathways to the peripheral vascular system are composed of three principal sets of neurons. The primary neurons arise in the diencephalon (posterior hypothalamic nucleus) and extend to the cells in the anterolateral column of the spinal cord. Neurons of the second order (preganglionic fibers) arise in the anterolateral gray columns of the cord and connect with the sympathetic chain through the white rami communicantes. The neurons of the third order (postganglionic fibers) arise in the sympathetic ganglia and extend to vascular and visceral structures of the somatic area, in addition to corresponding structures in the splanchnic areas. The nerve supply reaches the somatic area through the gray rami which connect each spinal nerve with the sympathetic chain. Further, these fibers from the sympathetic chain, after joining the spinal nerves, are arranged in a fairly distinct segmental order. Wide overlapping, considered as characteristic of the sympathetic nervous system, occurs mainly in the preganglionic connections above the postganglionic outflow from the sympathetic chain to the segmental nerves, and possibly to a yet undetermined degree in the spinal tract.

Thus the postganglionic supply in the lower extremities below the knees is mainly from the fourth and fifth lumbar and the first, second, and possibly the third sacral spinal levels of the sympathetic chain, and reaches the vascular and visceral structures through the respective roots mentioned. The lowest preganglionic connection of the sympathetic chain with the cord is the farthest caudal white ramus which is usually at the level of the second, but in some cases of the third lumbar spinal root. Therefore it is apparent that section of the sympathetic chain at the fourth lumbar level effects adequate sympathetic denervation of the visceral structures below that level and of the lower extremities below the knees.

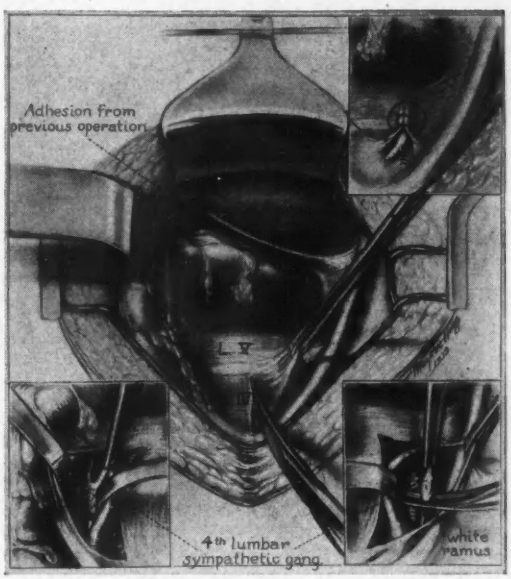

Figure 1.—The lumbar sympathetic chain is easily accessible through a midline transperitoneal approach. The ganglia can be excised or destroyed by electrocoagulation. To prevent regeneration, one end of the chain may be left out of the peritoneal cavity and the other within. There is no evidence, however, that regeneration occurs if this precaution is not taken.

A number of techniques have been recommended for lumbar sympathectomy.[2, 5, 8, 10, 14, 17] The variations are primarily in the approach, some surgeons preferring the transperitoneal (Figure 1) and others the retroperitoneal (Figure 2). From a practical point of view there appears to be little difference between the two if sympathectomy is accomplished, since morbidity and mortality are the same. Most observers agree, however, as to essentials in resection of any stated amount of the lumbar sympathetic chain. In most cases the operation involves the second, third, and fourth lumbar ganglia. When sympathectomy at a higher level is desired, for diseases above the knee, the approach must necessarily be modified.

For years the authors have used an electrocoagulation technique which seems superior to the standard resection of the sympathetic chain, since it effectively and more quickly accomplishes the purpose. After electrocoagulation any tendency to regeneration of the nerve, which appears doubtful, is barred by the greater scar formation following this operation. The lasting effectiveness of the method has been demonstrated in tests of electrical resistance and sweating (Figure 3) made as long as five years after electrocoagulation of the sympathetic chain at the fourth lumbar level.

The material for this review consists of 50 cases in which vascular and visceral disorders were treated

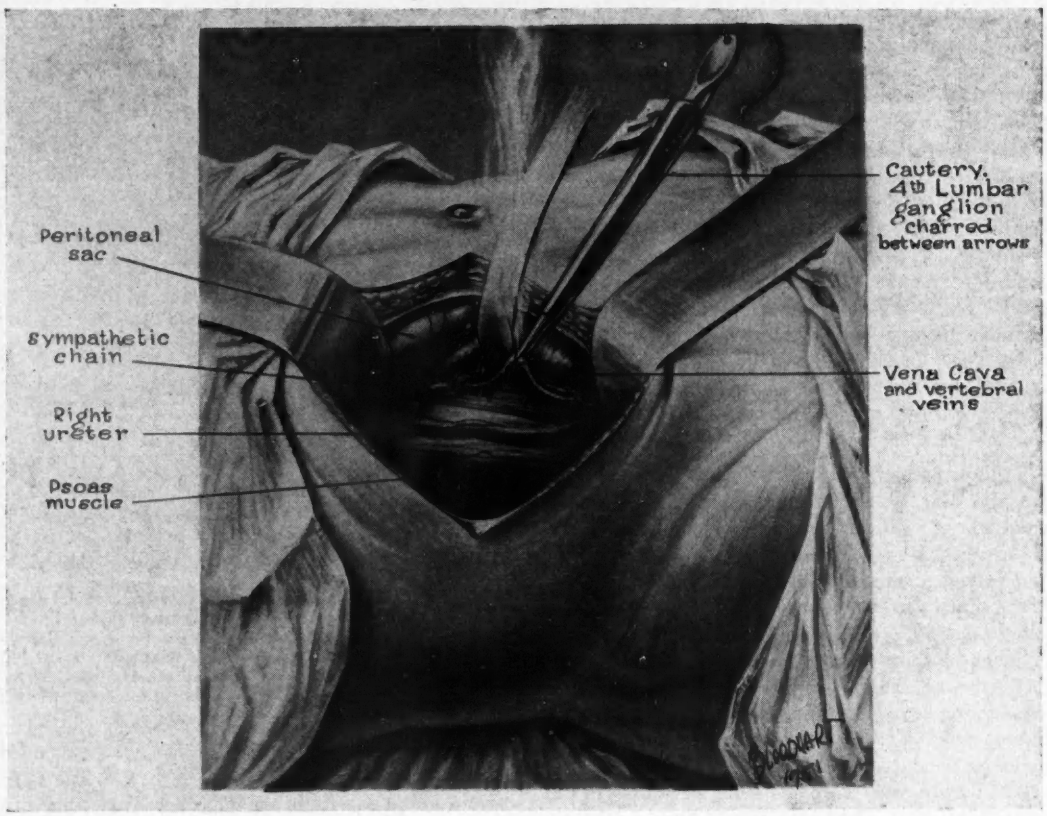

Figure 2.—The retroperitoneal approach to the lumbar sympathetic chain is easily accomplished through a transverse skin incision and a muscle splitting type of operation. The ureter generally is not seen, since it comes away with the peritoneum. In the case portrayed, however, it was adherent to the psoas muscle and could have been injured if not observed. The electrocoagulation technique is illustrated.

by lumbar sympathectomy. These cases represent, for the most part, the conditions in which, in the authors' judgment, the operation is indicated.

Arteriosclerotic vascular insufficiency: Cases with this diagnosis constituted the largest group—21. Eighteen patients were men and three were women. Their ages ranged from 51 to 80 years and the duration of symptoms from three weeks to ten years. Occupation did not appear to be a factor in the development of symptoms. Two patients had never used tobacco. In all cases there was constant pain in the feet and calves on walking—the principal cause of disability. Coldness of the extremities was also a common complaint. On examination it was usually observed that peripheral circulation was retarded, as was capillary filling in the toes, and that the feet were cyanotic when dependent and blanched when elevated.

In four patients who had only unilateral symptoms the operation was limited to the affected side; in the other 17 it was bilateral. The transperitoneal approach was used in only one case, the retro-

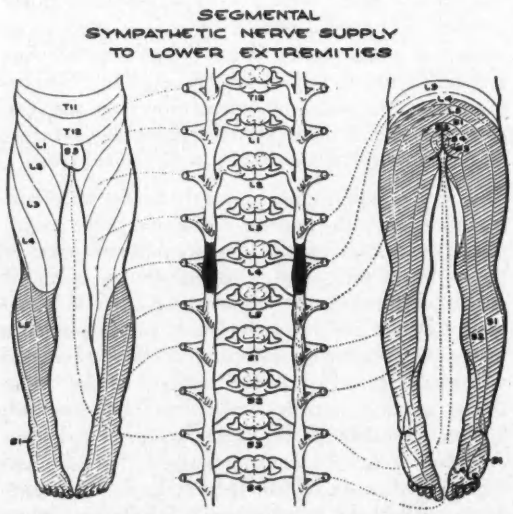

Figure 3.—Peripherovascular studies disclosed no change in the effect of sympathectomy by the electrocoagulation technique as long as five years after operation.

peritoneal in 20. The extent of the operation varied over the years. The first four lumbar ganglia were destroyed in one patient; the second and third in two; the second, third and fourth in seven; the third and fourth in five; and the fourth in six. Destruction of the fourth ganglion alone had results quite as good as the more extensive procedures, and the authors now believe that more extensive operation was unnecessary in the other cases, since there were no symptoms above the knees in any of the patients.

Regardless of the extent of sympathectomy, there was complete relief from symptoms in 16 cases and great improvement in four. In the remaining case the extent of relief could not be properly evaluated because of narcotic addiction, but the patient admitted some improvement which was evidenced by increased walking ability.

In two patients who had had symptoms of long duration there was sufficient improvement so that they could return to their occupations, although they had some pain on unusual effort.

In four patients impending gangrene necessitated amputation of one or two gangrenous toes after sympathectomy, but symptoms were relieved. In a fifth patient with extensive pregangrenous manifestations the left foot was amputated; healing was satisfactory but thereafter the patient had phantom foot pain.

In two cases occlusion of a major vessel of one leg had been evidenced some time after onset of bilateral vascular insufficiency and had increased the disability in the affected leg, although gangrene had not developed. In both cases, after bilateral sympathectomy, there was pronounced improvement in the occluded leg and relief of pain in the other leg.

Thromboangiitis obliterans: Sympathectomy was done unilaterally on two men and bilaterally on eight, in all cases by the retroperitoneal approach. The patients were aged 21 to 50 years, the majority being in the forties. Symptoms had been present from six months to 15 years. In five cases the second, third and fourth lumbar ganglia were destroyed; in three, the third and fourth; in two, the fourth only. As the symptoms in all cases were confined to the feet and the muscles of the calf, relief was as good in the cases in which operation was confined to the fourth lumbar ganglion as it was in those in which the more extensive operations were done.

Thrombosis and gangrene of one or more toes had occurred in three patients before operation, and in two patients in whom gangrene had been impending before operation it developed a few days after operation. In all these cases the gangrenous toes were removed after sympathectomy and the wounds healed satisfactorily.

The patients were observed a year to ten years after operation. Five who had previously used tobacco and had continued to use it were free of symptoms. Of the other five who were relieved sufficiently to return to their occupations, one had never used tobacco and two others had discontinued the use of it before operation with some relief, they thought, in the intensity of symptoms. One patient who had never discontinued the use of tobacco, and who had been treated by destruction of the fourth lumbar ganglion only, was still free of symptoms in the lower extremities ten years later but had signs of disease in the upper extremities.

Raynaud's disease: Three men and four women, aged 24 to 41 years, had had symptoms for one to five years. Gangrene had necessitated amputation of the affected toes in two patients. The transperitoneal approach was used in two patients, the retroperitoneal approach in five; in all cases sympathectomy was bilateral. The fourth lumbar ganglion was destroyed in three cases; the second, third and fourth in four. Equal relief of symptoms was obtained in all cases.

Thrombophlebitis: Reflex sympathetic dystrophy followed acute thrombophlebitis in one patient. The extremities were cold, clammy and cyanotic and pain occurred in them on exertion. The second, third, and fourth ganglia were destroyed bilaterally. The patient was still free of symptoms two years later when treated for subdural hematoma.

Scleroderma: No apparent effect was obtained by destruction of the second, third and fourth lumbar ganglia on one side in an effort to relieve severe generalized scleroderma.

Post-traumatic reflex sympathetic dystrophy: In three patients the condition, although confined to the injured leg, was sufficiently severe to justify sympathectomy. In a girl the injury had affected the major vessels and caused gangrene of the foot. Preservation of a good stump below the knee might not have been possible without sympathectomy. In another girl symptoms came on after an injury in which the muscles of the leg were stretched; after sympathectomy at the fourth lumbar level a year later, symptoms subsided. In the third case, after a bruising injury, multiple fractures and lacerations involving the peroneal nerve were repaired but the extremity remained cold and clammy and pain persisted. A year later prompt relief was obtained by sympathectomy at the fourth lumbar level.

Sympathectomy was considered for a 16-year-old boy in whom, after infection of a laceration about the sciatic nerve, there was sensory and motor impairment with coldness, cyanosis and pain below the knee. The pain and signs of vascular insufficiency

promptly subsided after neurolysis, and a year later the patient had made a good recovery.

Causalgia: A 53-year-old woman received a minor bruise over the peroneal nerve. Pain developed almost immediately; it persisted and was not relieved by neurolysis. The limb was hot, dry and hypersensitive; it appeared hyperemic, the skin thin and shiny and the nails showing incipient atrophy. After sympathectomy at the second, third and fourth lumbar levels the condition was not relieved but aggravated. The experiences of other surgeons with sympathectomy for causalgia likewise have not been encouraging.[12]

Spinal sympathetic dystrophy: A 47-year-old man had had coldness and clamminess in the extremities and cramps in the legs on walking. The condition was static and the cause was obscure. Increased reflexes in the lower extremities and bilateral signs of disease of the pyramidal tract were the only signs observed in extensive investigation. The feet were cold and clammy and were cyanotic when dependent. Pronounced spasm of the peripheral vessels was observed. After sympathectomy at the fourth lumbar level symptoms were relieved but no changes were noted in the signs of disorder of the pyramidal tract.

Acquired megacolon: Four women and one man, aged 37 to 48 years, had had symptoms for five to 15 years with increasing resistance to medical management; mild symptoms of cord bladder were present in all cases. One patient had paralysis agitans and another had congenital atresia of the spinal dura mater[3] at the fourth lumbar level. In all cases sympathectomy was done by the abdominal approach; as no cause of the disorder was apparent, the second, third and fourth lumbar ganglia were destroyed by electrocoagulation. Great improvement followed in all cases, with obstipation eliminated and constipation much more easily managed.

Selection of patients for operation in the series here reported was conservative; only when symptoms were such as might reasonably be expected to yield to such treatment was operation carried out. It seems likely that many patients who were advised to discontinue the use of tobacco did so and were relieved of symptoms sufficiently so that they did not come under the authors' observation, particularly patients with arteriosclerosis and thromboangiitis obliterans. Since the aggravating influence of nicotine on vasospastic disorders is well known, the use of tobacco in these conditions should be discouraged.

The most striking response to sympathectomy was in the disorders of peripheral circulation. Contrary to what might have been expected, vasospasm appears to be the principal cause of symptoms in arteriosclerotic vascular deficiency. It should be emphasized that in this condition symptoms are usually present long before thrombotic catastrophes occur, and early operation may forestall irreversible vascular changes. Not only are symptoms relieved by sympathectomy, but the progress of the disease is retarded and the hazard of infarction reduced. These general considerations likewise apply to other vascular disorders mentioned in this review.

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The Practice of Allergy

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• *Allergic disease has no one common denominator but may be due to various causes. Tests with allergenic substances are important but not infallible, and should not be the sole criteria of clinical sensitivity. They should not be employed indiscriminately. Much progress in utilizing all forms of modern medical treatment has been made. Finally, in treating patients with allergic disease, kindness and consideration remain the attributes that distinguish good allergists.*

IN THE PROGRESS of medicine, our age surpasses the span of many centuries. More has happened in the space of a generation than in all the years that have gone before. We have learned about stress, and the complicated relation of endocrines to the body and to each other. We have discovered the part minerals play in our well-being. The philosophy of Freud has brought new force in our time and a new concept of psychodynamics and psychotherapy. There is the discovery of antibiotics which may ultimately erase from memory many of the serious illnesses, some of which previously ended life.

The use of vaccines, serums, antitoxins and other similar weapons has made the little white hearse drawn by horses with white plumes, so common a sight on our streets in former days, a thing of the past. Today we dimly recall the colored isolation cards that were posted on front doors. We vaguely remember rules of isolation prescribed by local health boards in the days of our childhood. The span of life has increased as childhood mortality and adult morbidity have decreased. No longer do we surrender blood dyscrasias to the grim reaper without strenuous fight and often victory. Blood transfusions and surgical procedures have attained new perfection. Our undergraduate and postgraduate training, fortified with an exhaustive and integrated curriculum, has resulted in a corps of highly enlightened and educationally endowed physicians; the knowledge gained and traversed in laboratory, lecture and clinical assignments has given us men of vision, skill and quality in all branches of medical science and art. New specialties and specialists have developed — otolaryngologists, cardiologists, chest physicians, physiotherapists, radiologists, hematologists and many others. Not among the least of specialties that have evolved from the newer knowledge of disease processes is that dealing with allergy.

Men who cherish the history, philosophy and literature of this new specialty have surmised that when Lucretius observed that "One man's meat might be another man's poison," he was alluding to the allergenic reaction to food. Similarly, hopeful latter day medical historians have pointed out that when Hippocrates, in his sixty-fourth aphorism, spoke of headaches due to ingestion of milk, it is probable he touched upon an allergic reaction well known today.

Allergy is one of the youngest of our juvenescent medical specialties. The very term *allergy* did not appear in our medical vocabulary until after the beginning of this century (1906), and there is still much about the fundamentals of allergy we do not know. For example, we talk freely about skin-sensitizing antibodies and we can demonstrate them, yet we do not know how they are produced. We speak glibly about the allergic reaction; we know there is a release of histamine, but what other substances are released as a result of the antigen-antibody reaction we do not know. The pathologic roots and branches of allergy are neither well understood nor well described, and despite intensive study of so-called bacterial allergy, it still remains a confused, highly controversial and debatable subject among allergists.

THE PSYCHOSOMATIC FACTOR IN ALLERGY

It will be recalled that, in the first edition of Osler's *Principles and Practice of Medicine* asthma was defined simply and solely as a "neurotic affliction." In subsequent editions, the term "neurotic" was qualified and modified until, in the twelfth edition, 1935, the word "neurotic" was deleted entirely. However, the pendulum apparently has swung back, and today, our psychiatric colleagues are using the term *psychosomatic asthma* to designate the psychosomatic cause of asthma, as opposed to the allergic or infectious origin which most allergists had begun to feel at last was firmly established.

The term *psychosomatic* has at least two connotations. To physicians who think only in terms of organic disease, the adjective indicates the effect of

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mind on organic disease. To these physicians it is conceivable and readily admitted that psychologic influences may aggravate, precipitate or maintain the symptoms of an already existing organic disease. On the other hand, psychiatrists are inclined to use the term *psychosomatic* to indicate a disease or illness which originates *de novo* as a result of personality problems, emotional influences or psychological factors.

Without entering into profound controversial argumentation, I believe most of us can agree that, in every case of asthma, there exists an emotional component that varies in degree from practically negligible to paramount. It may be that emotional impulses from the higher centers of the brain, transmitted by way of autonomic nervous system, increase the permeability of blood vessels so that allergens previously held back penetrate vascular walls; or that, by increasing the blood supply to a susceptible tissue or organ, they indirectly may aid the union of a circulating antigen with a sessile antibody. If this speculation is accepted, then there might be further agreement that psychotherapy does not alter the fundamental allergic background, but instead allows an allergic individual to come into contact with noxious allergens with impunity.

As allergists, we should be chary of accepting any or only one point of view as to the cause of asthma. There is no unitarian hypothesis that covers our present knowledge of the disease or, for that matter, of most of allergy in general.

As an illustration of the pitfall in the path of physicians who adopt but one point of view as to the cause of asthma, there is the reported case of an actress who always had an asthmatic attack before her appearance on the stage. Stage fright was assumed to be the unbalancing factor until it was found that she was sensitive to one of the ingredients of her make-up and that the asthma was purely the result of allergic reaction.[1] On the other hand, Moos[2] reported the case of a patient who regularly had attacks of asthma in the evening when supper was being prepared. The kitchen smells were believed to be the cause, and all doors were kept carefully closed. It was revealed, however, on analysis, that it was a conversation at supper-time which had extremely excited the patient that caused the time fixation.

Therefore, in this matter of organic versus psychosomatic influence in allergic disease it would be well to emulate Walter Savage, whose wish it was to walk always with Epicurus on the right and Epictetus on the left. Allergists can well afford to be middle-of-the-roaders with regard to etiology in allergic disease so long as they take care not to neglect either the allergic or the neuropsychiatric aspect.

ALLERGY TESTS

In January 1950 a question on tests in allergic states was posed to the members of the International Correspondence Society of Allergists.[3] The question was as follows: "How many and what type of skin tests do you consider essential in the survey of a case of bronchial asthma?" The question was answered by allergists from every section of the country, and, as might be expected, every kind of answer was received. There were some physicians who replied that upon some patients they do no tests at all. There were others who admitted they do as many as 400 tests, and, furthermore, asserted that not only should an asthmatic person be tested for sensitivity to environmental allergens, molds, pollen and foods that he eats, but also as to substances that he might eat as a substitute for food.

Routine skin testing of a patient for sensitivity to a large number of substances that he does not come in contact with and to foods that he does not eat has made the the public suspicious of the tests and has caused them to wonder how necessary or valuable they really are. We may as well be honest with ourselves and face the fact that skin tests occasionally may be done not because they are necessary in determining the cause of allergic disease but because they entail additional visits to an avaricious physician. Fortunately the number of dishonest allergists, like the number of dishonest physicians in general, is low. But we do not want any. To protect a trusting public, to answer skeptics with probity and to preserve the prestige of our specialty, we have the means by which the many honest have always prevailed over scoundrels—coventry.

Almost as disturbing to a number of us is the allergist who prescribes extremely restricted diets on the basis of food skin tests alone; or who advises patients to do away with the padding under their carpets or throw out their upholstered furniture, again solely on the basis of results of skin tests without regard to clinical history or trial. Skin tests should be zealously evaluated clinically before a patient is given advice that will disturb his manner of living, change his environment or otherwise discommode him or put him to additional expense.

In a recent editorial in the *Journal of Allergy*, the editor discussed the additional problem of the standardization of allergenic extracts. He pointed out that "the patient, under treatment by one allergist, who moves to a new locality and consults a different physician, is apt to find that he is essentially starting treatment again at the beginning. Even the repetition of skin tests, using another make of extract, often leads to divergent results which confuse the patient and lessens his confidence in the whole practice of allergy." Indeed, this very thing may happen

when a patient consults two allergists in the same city where the two allergists use extracts prepared by two different laboratories. That we should rationalize our skin testing is quite evident. A uniformity of preparation and standardization is mandatory if we are to raise the level of allergic diagnosis and treatment.

ALLERGY AN INTEGRAL PART OF INTERNAL MEDICINE

It is refreshing to note the increasing number of allergists who have not forgotten that they are internists as well as allergists. Such physicians studiously follow the recent advances in medicine. In every case of allergic disease, they explore all avenues of differential diagnosis, and with emphasis of their action on physiological mechanisms, they willingly adopt and readily use the most recent agents, biological agents and drugs and therapy.

In infantile eczema, when the skin has become secondarily infected because of scratching, and antibiotics are indicated, a well rounded allergist uses them intensively. Where an allergic condition is initiated or aggravated by sinusitis, and the bacterial organisms recovered from the sinuses and sputum are sensitive to penicillin, he prescribes it intramuscularly or by aerosol in proper concentration. When the sinus organisms are resistant to penicillin, he either uses the newer antibiotics, such as magnamycin and erythromycin, or he washes the sinuses and treats them until they are clear, or refers the patient to a competent colleague for similar therapy. In dealing with asthmatic patients who are too weak to cough up the tenacious sputum, he may resort to bronchoscopy. He is alert in recognizing, diagnosing, and treating the complications of asthma. When it accompanies the menopause, or is increased at that period, he employs estrogenic therapy. Adrenocorticotropic hormones and cortisone are used, but of course with discrimination. In other words, allergists with a high regard for the specialty of their choice recognize it as an integral part of internal medicine. With invincible conviction that the future of medicine ultimately will discover a more complete answer to the riddle of bronchial asthma, the alert and faithful allergist employs every means at his present command to unravel the actual cause or causes, relieve the distressing symptoms and hinder the progress of the allergic state.

THE QUALITY OF THE ALLERGIST

In the practice of allergy today it is still necessary for allergists to exercise qualities of the heart, as well as the mind, in the treatment of patients. One cannot treat an allergic person completely by just taking a history, performing a physical examination, advising laboratory and sensitivity tests, providing immunization and restriction of diet or prescribing drugs. Something more is necessary. Some say that to treat a patient completely the physician must be interested in the patient as a person. Others insist he must have an empathetic attitude toward the suffering or discomfort the patient is experiencing. Perhaps the old Arabic proverb, "No man is a good physician who has never been sick" contains more than an element of truth.

It seems to me that all might be contained within the word *kindness*, which all physicians should keep uppermost in mind when they treat patients. This is especially true of allergists, for they are dealing with hypersensitive patients at all times. This kindness should manifest itself first, perhaps, in the matter of fees, subject to which medicine, in its best estate, has lately been devoting much attention. Our fees should be fair and equitable for the services we render. They should not be so low as to ignore the cost of office expense, or neglect proper acknowledgment for the years of training necessary to become specialists. On the other hand, they should not be so high as to bring distrust to our patients, cause them to be hostile, or lead them to believe they are being exploited. In the practice of allergy today we cannot afford to be indifferent to the enormous economic changes that have taken place in the last quarter of a century. By keeping fees equitable, we shall be strengthening the medical profession and at the same time dedicating ourselves to the social progress of the community.

When a patient's burden grows heavy and the way hard, as good physicians we can do no less than attempt as best we can to make the burden lighter and the path easier trod. Hippocrates, in one of his precepts, said, "Some patients, though conscious that their condition is perilous, recover their health simply through their contentment with the goodness of the physician."

We must guard, however, against promising more than we can fulfill, and in allergy that requires discipline in thought and speech. Kindness to our patients demands honesty, consideration, tact, sincerity, uprightness, the quality of loyalty and faithfulness. It implies conformity with fact and agreement with reality.

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CASE REPORTS

- **Combined Auricular Septal Defect and Thrombosis of the Major Pulmonary Artery**
- **Spontaneous Perforation of the Esophagus**
- **Cat Scratch Disease on the San Francisco Peninsula**
- **Cat Scratch Disease in the Los Angeles Area**

Combined Auricular Septal Defect and Thrombosis of the Major Pulmonary Artery

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IN A RECENT clinicopathological conference[3] reported in the *New England Journal of Medicine* it was stated that there have been only about five cases of combined auricular septal defect and major pulmonary artery thrombosis reported in the literature. Following is a report of a case in which those conditions coexisted.

REPORT OF A CASE

A 30-year-old married Caucasian woman had always been able to engage in strenuous athletic activities (worked as a swimming instructor) without any symptoms until the age of 21, when she first noticed exertional dyspnea. She was then told that she had "a murmur." Dyspnea gradually increased, and when the patient was 24 years of age cyanosis and edema at the ankles were also noted. Digitalis was given and a diet low in salt prescribed, but dyspnea gradually increased. At the age of 26 the patient had one episode of hemoptysis. From about that time onward, exertional syncope occurred occasionally and paresthesia of the extremities was frequently noticed, but there was no pulmonary edema.

The patient was hospitalized 17 days during July 1950 for study. The temperature was 98 degrees F., the pulse rate 72, respirations 28 per minute. The blood pressure in the right arm was 115 mm. of mercury systolic and 70 mm. diastolic; in the left, 118 mm. and 70 mm., respectively. The patient was very thin, cyanotic and in moderate respiratory distress, with orthopnea developing even after the exertion of talking. The skin was generally pale, but cyanosis was present about the nose and mouth and under the nails. There was no jaundice and no eruptions or petechiae. Moderate clubbing of the fingers and toes was noted. Ocular movements, pupillary reactions, and visual fields were normal. There were no hemorrhages or exudate in the retinae but the retinal veins were full and bluish in color. The disc margins were well outlined. In the throat there was cyanosis of the buccal mucosa. There was no obvious distention of the veins in the neck but the carotid pulsations were active.

"Fullness" in the right superior-anterior portion of the thorax and a slight inspiratory lag on the left side were noted. The lungs were resonant to percussion, and normal breath sounds were present on auscultation. The precordium was hyperactive. A palpable diastolic thrill was present in the third left interspace. The cardiac rhythm was regular. The heart was considerably enlarged to the right and the pulmonary conus was prominent. The tones were partially obscured by a rather pronounced rumbling, diastolic murmur in the second and third left interspaces. It was transmitted over the entire precordium and was audible posteriorly in the interscapular area just to the left of the spine. A systolic murmur of lesser intensity was heard over the apex. P-2 was accentuated over A-2. No friction rubs were present. The edge of the liver, firm but not tender and not pulsating, was palpable 2 cm. below the right costal margin. There was no dependent edema. The dorsalis pedis pulses were palpable and of good volume.

Upon neurological examination it was noted that the cranial nerves were intact and that motor and sensory functions were normal. The sensorium was clear.

The patient was given 0.1 mg. of digitoxin daily. Thiomerin® (mercaptomerin sodium) was given intramuscularly as needed to control edema. On the tenth hospital day cardiac catheterization was carried out after prophylactic administration of penicillin and procaine amide hydrochloride. Throughout the 24-hour period following catheterization, the patient had very low blood pressure, as low as 50 mm. of mercury systolic and 30 mm. diastolic for

From the Glendale Sanitarium and Hospital.

brief periods. However, there was good response to symptomatic treatment and the patient was discharged with prescription of digitoxin and occasional injections of Thiomerin.

Laboratory Data

First hospital day. Venous pressure: 165 mm. of blood, right antecubital space (No. 20 needle). Circulation time: 16 seconds, arm to tongue (Decholin). Vital capacity: 3.0 liters. Electrocardiogram: Auricular rate 81; ventricular rate, 81; P-R interval, 0.16 seconds; rhythm, sinus arrythmia; P wave in lead V_2 inverted; QRS complexes, pronounced right axis deviation, increased amplitude throughout, normal duration; T wave in leads 3 and V_5 inverted; ST segment in leads 2, 3, and V_5 depressed; ST segment in leads V_1 and V_3 elevated. Interpretation of electrocardiogram: Right axis deviation, right ventricular "strain" and/or digitalis effect.

The urine was yellow and clear with specific gravity 1.014 and pH 6.0. There was a trace of sugar. In microscopic examination occasional leukocytes were noted, but no erythrocytes or casts. Results of a phenolsulfonphthalein test were:

Minutes	Volume	Per Cent
30	160	32
90	220	27
120	50	8
Total		67

Second day. The erythrocyte content of the blood was 7.01 million per cu. mm. and the hemoglobin content 19.6 gm. per 100 cc. Leukocytes numbered 8,150—polymorphonucleocytes 64 per cent, lymphocytes 27 per cent, and monocytes 9 per cent. Mean corpuscular volume, hemoglobin and hemoglobin concentration were within normal limits, and the erythrocyte sedimentation rate (not corrected for the increased number of cells) was 1 mm. in one hour. The icterus index was 6 units. Content of nonprotein nitrogen was 39 mg. per 100 cc., of sugar 76 mg. per 100 cc., and of carbon dioxide 23.7 mEq. The result of a test for blood in the stool was negative.

Third day. In an orthocardiogram the heart was noted to be greatly enlarged in the right ventricular area. The left auricle did not appear to be enlarged. The view of the left ventricle was obscured by the shadow of the spine and it was felt that this position might be owing to enlargement of the left ventricle or to considerable displacement caused by the abnormal size of the right ventricle. The pulmonary conus, pulmonary arterial segment and hilar vessels were huge. The peripheral pulmonary vessels did not appear to be enlarged. The aorta was small and appeared to be on the left. There was some fibrosis in the peripheral portion of the left second interspace. Examined fluoroscopically, the pulmonary conus and hilar vessels were observed to pulsate more than normally.

Tenth day. Results of cardiac catheterization were:

Catheter Position	Oxygen Volumes Per Cent	Pressure in mm. of Mercury Systolic	Pressure in mm. of Mercury Diastolic
Superior vena cava	10.97	---	---
Right auricle	11.83	14	6
Right ventricle (inflow tract)	12.15	37	23
Right ventricle (outflow tract)	11.50	40	10
Pulmonary artery (position 2)	11.89	27	16
Pulmonary artery (position 3)	10.91	----	----
Capacity	25.09	----	----
Femoral artery	12.58	56	38
Saturation (femoral artery)	50.10	----	----
Pulmonary vein (assumed as 95 per cent saturation)	24.09	----	----

	Flow	Index†
*Systemic flow $= \frac{143}{12.58 - 11.40} =$	121	78
*Pulmonary flow $= \frac{143}{24.09 - 11.40} =$	11.26	7.31

It was felt at the time of catheterization that there was a large right-to-left shunt through an auricular defect, although the possibility of a ventricular septal defect could not be ruled out.

The clinical impression was: Congenital heart disease, cyanotic type, with probable auricular septal defect, with a right-to-left shunt, accompanied by pulmonary hypertension.

About a year later the patient was seen at home because of an upper respiratory tract infection, for which penicillin was given. A few months later she was again observed at home on complaint of "pleuritic" pain. The blood pressure was 110 mm. of mercury systolic and 80 mm. diastolic. The thoracic pain became more severe in the next week; then pronounced dyspnea and acute pulmonary edema developed suddenly and the patient died.

Autopsy

Upon postmortem examination, pronounced cyanosis of the lips, face, upper trunk and nail beds was noted and there was considerable livor of the dependent portions of the body and moderate clubbing of the fingers and toes. The heart weighed 520 gm. (normal 250-300 gm.) and appeared enlarged in all dimensions. The right side of the heart was greatly dilated and hypertrophied; the right ventricle was 18 cm. in circumference and the thickness 9 mm. The

*The flow measurements are calculated by dividing the oxygen consumption of 143 cc. per minute by the arteriovenous differences. Thus: The arteriovenous difference for systemic flow is 12.58 (femoral artery) minus 11.40 (mean content between superior vena cava and right auricle). For pulmonary flow it is: 24.09 (pulmonary vein) minus 11.40 (mean auricular content).

†The cardiac index is the liters of blood flow per square meter of body surface area. It is calculated by dividing the usual flow measurement by the surface area of the patient (in the present case, 1.54 square meters).

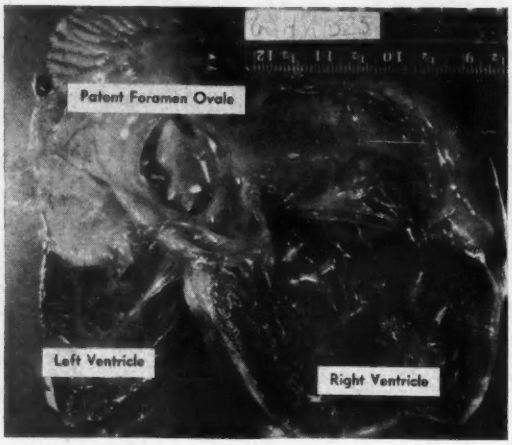

Figure 1.—Patent foramen ovale of interatrial septum.

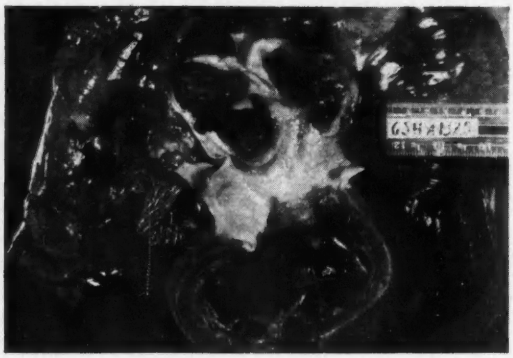

Figure 2.—Thrombus almost completely occluding pulmonary artery at point of bifurcation.

left side of the heart was also enlarged, but this was apparently owing to dilation of the left ventricle which was 12 cm. in circumference and 10 mm. thick. Sectioned surfaces showed no evidence of old or recent infarction. All of the valves were competent and free of vegetation or any other evidence of disease. The interatrial septum had a patent foramen ovale with a diameter of 5.1 cm. (Figure 1). The aorta was narrowed to a diameter of 1.3 cm. at a point 4 cm. above the aortic valve. The coronary arteries were normal. The pulmonary artery was considerably dilated and appeared to lead directly into the left lung. At the hilum, however, it bifurcated into the right and left branches. At the point of bifurcation the pulmonary artery was almost completely occluded by a thrombus showing prominent lines of Zahn (Figure 2). The thrombus, which was firm and adherent, extended into both branches of the pulmonary artery and into their major branches. The lumen of these arteries was approximately 5 per cent of normal. There was 300 cc. of fluid in the left pleural space and 100 cc. in the right. The lungs felt firm and on cut surfaces showed edema and congestion with a 6 mm. area of apparent infarction near the hilum of the left lung. Severe congestion of the liver was noted. In other organs there were no significant lesions.

Microscopic examination. Sections of the pulmonary artery were observed to be almost completely occluded by a thrombus that was well organized in its deeper portions with platelet, fibrin and red-cell layering only in the superficial and surface portions. No abnormality was noted in the wall of the artery. In sections of the heart slight hypertrophy of the myofibrillae composing the right ventricular wall was noted but there was no other significant lesion. Sections from both lungs showed moderate emphysema and edema, severe congestion and an area of hemorrhagic infarction adjacent to the pulmonary artery. In the liver, distention of the sinusoid spaces was noted. Sections of other organs showed slight congestion or no significant lesion.

SUMMARY

A case of auricular septal defect with almost complete thrombotic occlusion of the main pulmonary artery at its bifurcation is presented. No evidence of embolism or of underlying pulmonary artery disease could be found. Cardiac catheterization 16 months before death gave evidence of pulmonary hypertension and septal defect with a right-to-left shunt. The condition of the patient deteriorated progressively for nine years. She died of acute pulmonary edema at the age of 30.

ACKNOWLEDGEMENT

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Spontaneous Perforation of the Esophagus

A Report of Two Cases

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INCREASING NUMBERS of isolated reports of so-called spontaneous perforation of the esophagus are appearing in the literature. Although it is obviously a rare lesion, the fact that the authors observed two cases in two and a half years would indicate that it occurs more often than is commonly thought, and that physicians should be aware of the syndrome. The mortality rate is high[1, 2, 4, 5, 7] in untreated cases. Only by awareness of the condition can an early diagnosis be made and appropriate treatment promptly instituted. Excellent reviews of the subject have been published by Kinsella and co-workers[4] and by Samson.[7]

CASE REPORTS

CASE 1: The patient, a 54-year-old Negro man, was admitted to hospital on July 20, 1948, in severe distress with pain high in the epigastric area. Sixteen hours before admittance, he choked while eating beef steak, and when he attempted to vomit, severe epigastric and substernal pain that radiated straight through to the back occurred. It became increasingly severe.

The blood pressure was 160 mm. of mercury on systole and 100 mm. on diastole, the pulse rate 90, respirations 20 per minute and the temperature 98° F. The skin was cold and clammy. Upon auscultation of the heart, frequent extrasystoles were noted. There were occasional coarse rales at both lung bases. Spasm of the upper abdominal muscles was observed, and palpation in the epigastrium increased the substernal and low thoracic pain. Peristalsis was absent. Acute tenderness and spasm were present in the left costovertebral angle.

An irregular area of increased density in the lower part of the chest on the left side, compatible with a pneumonic process at the left base, was noted roentgenographically. An electrocardiogram was within normal limits. Leukocytes numbered 13,700 per cu. mm. of blood and the cell differential was within normal limits. There was a trace of albumin in the urine but no other abnormalities.

The impressions of the resident and consulting staff were as follows: Acute myocardial infarction, acute pancreatitis, dissecting aneurysm of the aorta, posterior penetrating duodenal ulcer and splenic infarction.

The condition of the patient deteriorated despite supportive measures and he died 30 hours after admittance.

At autopsy a 1½-inch longitudinal tear of the lower esophagus, approximately 1 inch above the cardioesophageal junction, was observed. No other lesion was noted in this area. A large piece of undigested meat lay in the mediastinum and there was evidence of purulent mediastinitis. There was 600 cc. of bloody fluid in the pleural cavity.

CASE 2: A 72-year-old white woman was admitted to hospital on March 14, 1951, semicomatose and in great distress. With difficulty it was learned from her that an hour previously she had become "car sick," had vomited and thereupon had had sudden severe pain in the epigastrium and the lower part of the left side of the chest "as if something gave way." The patient gave no history of previous gastrointestinal distress except for occasional mild dysphagia. It was discovered later that in 1940 a diagnosis of mild cardiospasm had been made by another physician.

Upon physical examination moderate cyanosis was noted and the skin over the flanks and extremities was blotchy. The blood pressure was 140 mm. of mercury on systole and 70 mm. on diastole, the pulse rate 120 and respirations 30 per minute. No murmurs were heard in the heart, the tones were fairly good and the rhythm was regular. Diminished resonance and impaired breath sounds were noted at the side and the back of the chest on the left side. There was moderate spasm of the upper abdominal muscles with acute tenderness in the epigastrium. Peristalsis was absent. Tenderness in the left flank and around the thoracic margin was noted.

In x-ray films of the chest and abdomen there was evidence of fluid in the lower left side of the chest and questionable evidence of air in the mediastinum but none of intraperitoneal air.

The hemoglobin content of the blood was 12.8 gm. per 100 cc. and erythrocytes numbered 4,230,000 per cu. mm. There were 23,100 leukocytes per cu. mm.—76 per cent polymorphonuclear cells, 36 per cent lymphocytes, 2 per cent monocytes and 1 per cent eosinophils.

A tentative diagnosis of a spontaneous perforation of the thoracic esophagus was made and was confirmed when gastric contents were withdrawn from the left pleural cavity by thoracentesis.

The patient improved when oxygen inhalation and plasma infusions were given and was taken to the operating room approximately two hours after admittance and three hours after the onset of pain.

The chest was opened through the bed of the eighth rib. A large amount of air was present in the pleural cavity. The lung was totally collapsed and the pleural cavity was filled with gastric contents. Particles of undigested food and considerable fibrin were present over the lung and mediastinal surfaces. A ragged slit was noted in the mediastinum with inflammatory reaction of necrotizing type in the mediastinal tissues. The entire thorax was lavaged with saline solution and all the food particles and fluid removed. The mediastinum was then widely opened and the esophagus mobilized. It was found necessary to mobilize the cardioesophageal junction to get adequate exposure. When this was accomplished a longitudinal slit, about 4 cm. in length, through all layers of the left esophageal wall was observed. It extended almost to the cardioesopha-

geal junction. The slit was repaired in layers with fine cotton sutures. The mediastinum was left open and the chest was closed. Two tubes, one anterior and one posterolateral, were placed for drainage. A Levine tube had previously been placed under direct vision into the stomach for decompression.

Gastric suction and water seal drainage were provided and penicillin, streptomycin and aureomycin were given parenterally along with supportive fluids for the following several days. The patient recovered gradually and was discharged on the 18th postoperative day. She was taking an adequate soft diet by the seventh postoperative day.

DIAGNOSIS

The symptoms of perforation of the esophagus are so severe that it is obvious both to the patient and the physician that a catastrophic incident has occurred. Although the symptoms usually are such as to indicate an upper abdominal lesion, the associated dyspnea and cyanosis suggest difficulty above the diaphragm. The pain is sudden and excruciating, usually follows a sudden effort of regurgitation and may be described as epigastric or substernal. Pain in the lower thoracic region of the back is common, as is pain low in the left side of the chest. Mediastinal emphysema (as was noted in Case 2) and palpable crepitation in the neck later in the course of the disease may be noted. Roentgenograms may reveal evidence of fluid or air in the pleural cavity. This was observed in both of the cases here reported. Swallowed Lipiodol® may extravasate into the mediastinum or pleural cavity, further confirming the diagnosis. Aspiration of gastric contents from the pleural cavity may give confirmatory evidence if the mediastinal pleura has been ruptured, as it was in both of the cases reported here.

TREATMENT

All recent communications[3, 4, 6, 7] have emphasized the need for immediate surgical repair. The critical appearance and state of the patient should present no contraindication to thoracotomy after the institution of rapid measures toward supportive treatment. These initial measures consist of oxygen inhalation, infusion of plasma or whole blood, administration of antibiotics and, in the presence of tension or excessive amounts of fluid, aspiration of the pleural cavity.

Recovery following late drainage of the pleural cavity has been reported in a few cases. This procedure should be reserved for misdiagnosed cases in which the patient is seen late in the course of the illness following an initial spontaneous improvement.

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Cat Scratch Disease on the San Francisco Peninsula

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CAT SCRATCH DISEASE, or benign lymphoreticulosis, is a disorder first recognized by Foshay of Cincinnati in 1932. He observed certain cases of lymphadenitis in which the pus was always sterile and in which serological studies were negative for tularemia. A history of cat bite or scratch, or of close association with cats, was obtained in all these cases. The observations were never published.

In 1945 Hangar of New York studied an apparent occurrence of this disease in himself. Paronychia developed and regional adenitis, malaise and fever ensued. Rose and Hangar prepared an antigen which, when it was injected intradermally, evoked intense reaction similar to the response to tuberculin. With the same antigen they obtained positive reaction in patients formerly studied by Foshay. All attempts to inoculate hen's eggs and transmit the disease to animals failed. In Hangar's case there was no known bite or scratch from the family cat, but there was intimate contact with the animal at the time paronychia developed.

When in 1947 Debré of Paris visited Foshay, he learned of the cat scratch disease entity and of the intradermal test with the specific antigen. Having seen similar cases in Paris, he took some antigen with him on his return and was able to prove the identity of the disease with that described by Foshay. His report, La Maladie des Griffes de Chat,[4] was the first that was published. Since then many cases have been reported from Paris. The first report in English was made by Greer and Keefer in 1951.[7] Daniels and MacMurray of the District of Columbia made extensive studies and published two papers.[2,3] There

From the Stanford University Health Service and The Palo Alto Clinic.

have been three reports of cases in California, by Gifford and co-workers,[6] by Epstein[5] and by Cuttle,[1] all published in 1952. So far no cases have been reported from the San Francisco Peninsula.

It should be noted that although the cat plays an important part in dissemination, the animal itself has never been found to show any signs of disease, and the skin test with specific antigen gives no reaction.

The disease has not yet been etiologically defined but it is presumed that the causative factor is a large virus related to the psittacosis lymphogranuloma group. There is usually a tendency to slight cross-agglutination with psittacosis antigen. The disease has occurred in patients from 18 months to 57 years of age.

REPORT OF A CASE

The patient, a man 29 years of age, reported to the Health Service, Stanford University, on May 5, 1952, because of a lump just above the right elbow. He felt well and there were no symptoms of acute infection. No enlargement of axillary nodes was noted. There was a small scratch with indolent infection on the dorsum of the third finger of the right hand. No treatment was given but the patient was told to return if the lump did not recede. Ten days later he returned because the mass above the elbow was considerably larger and on this visit two small nodes were felt in the right axilla. The indolent lesion on the finger was unchanged. Although the patient had had no malaise and no fever that he was aware of, when inquiry elicited that there were two house cats to which he was exposed, the possibility of cat scratch disease was considered. The hemoglobin content of the blood was 15 gm. per 100 cc. Erythrocytes numbered 5 million per cu. mm. and leukocytes 4,900—49 per cent lymphocytes, 47 per cent neutrophils, 2 per cent basophils, 1 per cent monocytes and 1 per cent eosinophils. The sedimentation rate was 6 mm. in one hour. Heterophil antigen agglutination and the result of a Wassermann test were negative.

On June 6 an intradermal test with cat scratch disease antigen was carried out and 48 hours later there was a 4 mm. papule with a 2.5 cm. pink areola at the site of injection, which was interpreted as a strongly positive reaction. The epitrochlear mass by then was greatly enlarged and fluctuant. At the center the skin was dark pink, and from there it faded gradually to a violaceous color at the periphery. The epidermis over the area of deepest color was scaling (see Fig. 1). At this time 40 cc. of sanguinopurulent exudate was withdrawn. The axillary nodes had coalesced and the mass was approximately 4 cm. in diameter, but was not fluctuant.

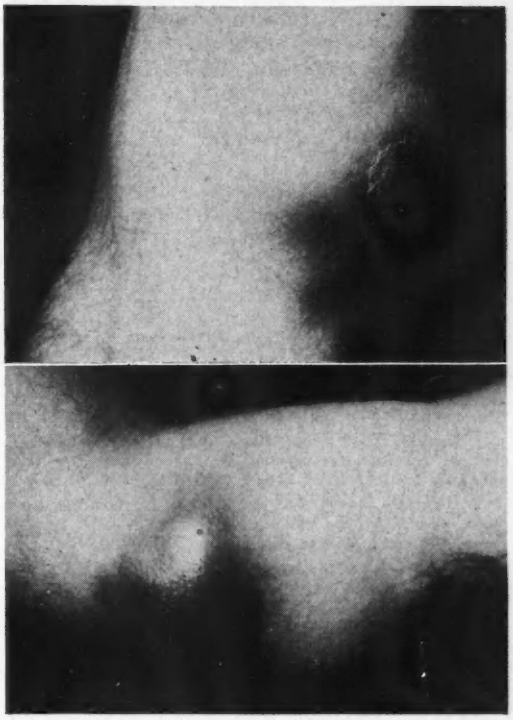

Figure 1.—*Upper*—Mass above the elbow at time of greatest enlargement and discoloration, June 6. *Lower*—On June 12 the mass was somewhat smaller than on June 6. This picture was made six days after first aspiration and just before the second.

No evidence of disease of the hilar nodes was seen in a roentgenogram of the chest taken June 9. On June 12 tuberculin, histoplasmin and coccidioidin skin tests were done and the results were negative. On June 16 agglutination for tularemia was negative. Complement fixation for Q fever was negative in all dilutions. Complement fixation with psittacosis antigen* was strongly positive in dilution 1:2 through dilution 1:16, equivocal at 1:32 and negative in greater dilution. Two weeks later there was a strongly positive reaction extending through dilution 1:32, a 1 plus reaction at 1:64 and negative result in higher dilutions.

Material was aspirated from the epitrochlear mass four times in 18 days and 94 cc. was withdrawn. The axillary tumor was aspirated twice and 8 cc. of yellowish purulent material was removed. The pus was sterile aerobically and anaerobically. Results of inoculation of guinea pigs, white rats and macacus rhesus monkeys were negative. An antigen was prepared from the material† and later used for intra-

*Through the courtesy of the Hooper Foundation.

†Courtesy of Dr. Houghton Gifford, Stanford Medical School.

dermal test on the patient, and again there was a very strongly positive reaction.

The masses gradually diminished and at last disappeared.

SUMMARY

A case of cat scratch disease in a resident of the San Francisco Peninsula, with suppuration of regional lymph nodes, is reported.

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Cat Scratch Disease in the Los Angeles Area

D. EDWARD FRANK, M.D., Sun Valley, California, and HERBERT I. HARDER, M.D., USAF (MC), Glendale

SINCE THE ORIGINAL REPORTS of cat scratch disease in Europe in 1950[2] and this in country in 1951[5] cases have been reported from many places, particularly from eastern, middle western and southern areas of the United States. Several cases in California have been reported[1, 3] and others diagnosed but not reported.[6, 8]

Several other descriptive terms have been used for the disease, such as cat scratch fever, benign inoculation lymphoreticulosis, cat scratch syndrome, benign lymphoreticulosis of inoculation, and possibly others. However, the uniformity of symptoms and data in reported cases seems to warrant the name *cat scratch disease*.

It is a benign self-limited disease, apparently of viral origin.[7] Characteristic features are tenderness of regional lyph nodes in association with systemic symptoms such as fever and malaise (rarely, cutaneous manifestations) that develop some two to three weeks after the appearance of a local, encrusted, oozing lesion at the site of a scratch or a bite by a cat or a break in the skin of a person who handles cats.

Much research on laboratory procedures for aid in diagnosis has shown that results of various kinds of determinations are essentially within normal limits, although in many cases the number of eosinophils in the blood is high in relation to the total number of leukocytes. The diagnosis can readily be established, however, by observing the reaction to intradermal injection of an antigen prepared from a suppurative node, or by biopsy of such a node.[4]

REPORT OF A CASE

A girl five and a half years of age was first observed in the office of one of the authors in Sun Valley, California (near Los Angeles) on October 13, 1952, with complaint of fever, slight nuchal rigidity and tenderness of axillary lymph nodes. Upon physical examination a small fresh scar on the left side of the chest was noted, and the lymph nodes in the left axillary region were enlarged, very tender and appeared to be matted together rather than separate and discrete. The temperature was 100° F. Penicillin, 450,000 units, was injected intramuscularly and a triple sulfonamide, gm. 0.25 by mouth four times daily. Three days later the axillary mass was larger, definitely matted and quite tender. No abnormalities were noted on examination of the blood or on urinalysis. Aureomycin, 100 mg. three times daily by mouth, was prescribed. When the patient was next examined four days later the nodes, still tender and undiminished in size, felt fixed in place. Aureomycin was continued. On October 27 the nodes were of the same size but the tenderness had subsided and surgical biopsy was advised.

The patient entered the hospital October 30. The hemoglobin content of the blood was 12.1 gm. per 100 cc. and erythrocytes numbered 4.3 million per cu. mm. Leukocytes numbered 7,000 per cu. mm.—41 per cent neutrophils, 48 per cent lymphocytes, 4 per cent monocytes and 7 per cent eosinophils. Results of urinalysis were normal.

A 4x3x1.5 cm. mass of tissue including four lymph nodes was removed for pathologic study.

PATHOLOGIST'S REPORT

The specimen was a mass of fibrofatty tissue with several lymph nodes imbedded in it, the largest of them 1 cm. in diameter. On microscopic examination of the lymph nodes it was noted that there were numerous semicaseous, necrotic foci containing a few polynuclear cells and surrounded by heavy mantles of epithelioid cells with occasional giant cells. No acid-fast organisms were observed. The diagnosis was granulomatous lymphadenitis consistent with cat scratch disease.

When questioned specifically the parents of the patient recalled that a cat had scratched her on the

chest about two and a half weeks before the onset of symptoms. The wound was small and had caused no alarm even though a small encrusted, oozing lesion, a slow-healing "sore," developed three days later.

Antigen prepared from the node of a patient who had had cat scratch disease six months previously was injected intradermally and the reaction (read like a tuberculin test reaction) was 2 plus 48 hours later.

SUMMARY

A case of cat scratch disease in a patient in the Los Angeles area was diagnosed by biopsy of enlarged lymph nodes and subsequent test by intradermal injection of antigen. The proportion of eosinophils in the blood was relatively high.

7949 Vineland Avenue.

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California MEDICINE

For information an preparation of manuscript, see advertising page 2

EDITORIAL

Interim Sessions

ON DECEMBER 13 the California Medical Association rang down the curtain on its Interim Session of the House of Delegates. The closing date came just nine days after the American Medical Association had concluded its Interim Session in St. Louis.

These two sessions were alike in one respect, unalike in another. The similarity came in the fact that both could probably have been cancelled without doing any damage. The disparity lay in the fact that the C.M.A. meeting was probably the last of its kind to be held, whereas the A.M.A. winter session is destined to continue.

Most medical organizations find it possible to conduct their legislative work on the basis of one annual meeting. If adequate time is allowed at annual sessions, the policy-making work of any large body can be conducted on an unemotional, straight-line basis. This concept, of course, is conditioned on the maintenance of a properly selected board of directors or council to act between the annual sessions of the top policy-making body.

When the A.M.A. started its Interim Sessions, times were somewhat different from the present. The House of Delegates, by and large, did not repose in the A.M.A. Board of Trustees the high degree of confidence noted today. Members of the House of Delegates wanted additional opportunity to establish policy and eliminate the possibility of poor policy emanating from the more frequently meeting Board of Trustees. The Interim Session was the device used to achieve this aim.

Once the A.M.A. Interim Session was launched, it became the occasion for adding scientific sessions. Then came scientific exhibits, then technical exhibits. Thus a second annual session was created in easy stages.

Attendance at the scientific meetings of the Interim Session of the A.M.A. has been somewhat disappointing to those who labor to produce a scientifically sound program. The ideal of bringing postgraduate training to the various cities of the country has not been realized.

The C.M.A. Interim Session was probably also set up as a protest on the part of some members against infrequent meetings, between which the C.M.A. Council handled all the Association's affairs. From almost the beginning of these meetings, however, the lack of confidence in the Council which was apparent in the revised Constitution and By-Laws, under which the Interim Session was created, began to dissipate. The goal of introducing business at one meeting, to be acted upon six months later, was never realized.

Emergency measures, eligible for action at the same meeting at which they were introduced, became the rule rather than the exception. Reference committees, which begged for expressions of opinion during the six-month lag between meetings, found little or no response from either members of the House of Delegates or the C.M.A. membership at large. The object sought in deferring action for six months was never attained.

Now, the By-Laws have been so amended that an Interim Session of the C.M.A. House of Delegates will be held only if the House itself, in Annual Session, votes to hold an Interim Session in the final six months of the year. Provision is still made for calling special meetings of the House, either by action of members of the House or by the Council.

Thus the opportunity for more frequent meetings of the House of Delegates is preserved but the requirement for additional meetings is dropped. This arrangement should be amply flexible to take care of the Association's business without adding the burden of another meeting to the load of the Delegates. This makes sense.

CALIFORNIA MEDICAL ASSOCIATION

NOTICES & REPORTS

Your C.M.A. Dues—What They Buy

DONALD D. LUM, M.D.
Chairman, Auditing Committee
California Medical Association

YOU, DOCTOR, paid $40 in dues to the California Medical Association last year. What did you get for your money?

Perhaps you are one of the few C.M.A. members who take the time to study the annual financial report. It is published in CALIFORNIA MEDICINE before each annual session, in full detail, but it is doubtful that its Hooper rating is very high.

Do you know, for instance, that for each dollar you pay into the C.M.A. in dues the Association takes in another 33 cents from other sources? Do you know that CALIFORNIA MEDICINE is not only self-supporting but returns a profit to the C.M.A. general fund?

As a C.M.A. member you are interested, of course, in how your dues money is spent and how much it costs *you* to maintain the state organization and carry on its services.

To show the uses to which your money in the C.M.A. is put, the fiscal year ended June 30, 1952, may be taken as a typical current year in receipts and expenditures. During that period you and your fellow members paid the C.M.A. $447,039 in dues. The Association took in another $146,816 from advertising, subscriptions, interest, exhibits and other sources. Thus your dues accounted for just three-fourths of the total revenue.

For this same period, the auditor's report shows, administrative expenses took 28.2 per cent of total funds for the year. Scientific, education and public relations activities took 41.1 per cent of these funds and the journal took 21.9 per cent. That left 8.8 per cent unexpended and taken into surplus at the fiscal year-end.

If we break down these percentage figures still further, we find that the actual administration of the two C.M.A. offices and their allied activities totaled just 13 per cent of the year's expenditures, or $5.20 of your dues money. When legal services are added to the actual C.M.A. office costs, $6 of your $40 dues are accounted for.

The C.M.A. maintains its headquarters office in San Francisco, where it employs five men and eight women. In the Los Angeles office there are two men and one woman. In addition, there are two part-time employees in the offices of the American Cancer Society, California Division, working with the Cancer Commission. There are two part-time employees in Stockton, handling the postgraduate work, and there is one full-time employee in the service of the Blood Bank Commission in San Francisco.

Two of these employees are physicians. Dr. Franklyn C. Hill serves as medical director of the Cancer Commission. His compensation is split between the C.M.A. and the American Cancer Society, California Division. Dr. Charles A. Broaddus serves half-time as Director of the Committee on Postgraduate Activities.

That is the staff working for you, under the direction of the C.M.A. Council, which controls all operations and establishes all budget recommendations for the approval of the House of Delegates.

If you translate the administrative salaries of these people into terms of your $40 annual dues, you are paying $2.88 a year for your administration. You pay another $2.08 a year to put on the Annual Session. You pay 16 cents for telephone and telegraph, 40 cents for rent and 8 cents for postage. Your Woman's Auxiliary takes 12 cents of your $40, and the Student A.M.A. the same amount. Last year you paid 8 cents for improvements to the San Francisco office, to make it a more presentable and more efficient operating base.

Your Council and Executive Committee, handling the responsibility of operating the C.M.A., cost you 52 cents and your Delegates to the American Medical Association accounted for another 68 cents.

In the section of expenditures classified by the certified public accountants as "scientific, education and public relations," the last-named item was the most costly to you, taking $6.35 of your $40 dues. Public policy and legislation accounted for another $3.47 of your dues and the Cancer Commission and Postgraduate Committee required $1.08 and $1.07, respectively. Your dues contribute 36 cents to two medical libraries which provide a packet service for all members. You spent 16 cents to encourage recruitment of student nurses.

These figures actually represent more than your pro rata cost of C.M.A. activities out of your $40 dues. With the added income from exhibits, advertising, etc., the Association had available $53.12 per member, of which your own share was the amount of the dues. The breakdown here is calculated on the dues money only; if other revenues are considered in the total, just reduce each of these pro rata costs by 25 per cent and you will find the actual cost, *in dues*, to you.

Your journal, CALIFORNIA MEDICINE, cost you $8.76, which includes $5.70 for printing, $1.12 for salaries, 99 cents for advertising sales expense and 11 cents for illustrations. Of course, the journal made a profit, so that actually it returned money to your Association; the cost figures are given here to show their relationship to all other expenditures.

It is interesting to note that of $593,855 disbursed last year, only $80 was charged to "miscellaneous" under general expenditures and only $145 to "sundries" under the journal accounting. The smallness of these items indicates the accuracy with which the auditors have established classifications of expense.

For the fiscal year ended June 30, 1952, here's how the C.M.A. shows its revenues:

	Amount	Per Cent of Total
*Dues	$412,379	69.4
Exhibits	20,055	3.4
Interest and miscellaneous	5,914	1.0
Advertising	117,683	19.8
Members' subscriptions	34,660	5.8
Other subscriptions	2,609	0.4
Reprint sales	555	0.1

*After deducting journal subscriptions to meet postal requirements.

TABLE 1.—*Details of expenditures by California Medical Association and the cost of each item in terms of dues.*

	Amount	Per Cent Total	Cost Per $40 Dues
ADMINISTRATIVE EXPENSE			
Salaries	$ 42,917	7.2	$2.88
Officers, Council, Executive Committee travel	7,956	1.3	.52
A.M.A. Delegates	10,481	1.7	.68
Annual Meeting	31,174	5.2	2.08
Council-Executive Committee meetings	2,195	0.4	.16
County Secretaries' meeting	1,145	0.2	.08
Los Angeles office expense	1,898	0.3	.12
Legal Department	12,065	2.0	.80
Organization expense	21,780	3.7	1.48
Rent	5,687	1.0	.40
Telephone-telegraph	2,354	0.4	.16
Supplies—office expense	6,076	1.0	.40
Postage	1,067	0.2	.08
Annuities	5,173	1.0	.40
Equipment	3,941	0.7	.28
Office improvements	1,326	0.2	.08
Payroll taxes	2,193	0.4	.16
Pensions	4,260	0.7	.28
Woman's Auxiliary	1,750	.03	.12
Student A.M.A.	1,708	0.3	.12
Miscellaneous	80	....	....
Sub-total	$167,228	28.2	$11.28
SCIENTIFIC, EDUCATIONAL AND PUBLIC RELATIONS			
Public Relations	$ 94,236	15.9	$ 6.35
Public Policy and Legislation	51,908	8.7	3.47
Benevolence Fund	10,936	1.8	.72
Postgraduate Instruction	15,900	2.7	1.08
Cancer Commission	15,201	2.7	1.07
Other Committees	48,207	8.1	3.23
Libraries	5,468	0.9	.36
Student Nurse Recruitment	2,500	0.4	.16
Sub-total	$244,356	41.1	$16.44
JOURNAL—*California Medicine*			
Printing	$ 84,623	14.3	$ 5.70
Advertising sales cost	14,667	2.5	.99
Salaries	16,795	2.8	1.12
Rent	2,745	0.5	.18
Telephone-telegraph	1,047	0.2	.08
Postage and mailing cost	4,499	0.8	.31
Addressing	1,704	0.3	.11
Illustrations	1,631	0.3	.11
Advertising discounts	2,114	0.4	.16
Sundries	145	....	....
Sub-total	$129,970	21.9	$ 8.76
SURPLUS	$ 52,301	8.8	$ 3.52
TOTALS	$593,855	100.0	$40.00

For the same period, expenditures, classified as the independent auditors show them, were:

	Amount	Per Cent of Total
Administrative	$167,228	28.2
Scientific, education and public relations	244,356	41.1
Journal	129,970	21.9
Excess revenues—to surplus	52,301	8.8

The three major expense classifications above are broken down into many components in the accompanying Table 1. There is no attempt here to define the various classifications of expense; most of the subtitles are self-explanatory. Mention should be made, however, that the item labeled "organization expense" is the cost of litigation carried on by the C.M.A.

This breakdown of expenditures will show you how much was spent last year for each item, what percentage of total expenditures is represented by each item and how much that cost is to you, out of your $40 dues. Remember that your dues dollar is worth $1.33 throughout this tabulation, so that your real cost in dues is 25 per cent less than the figures listed.

It is obvious from a study of this breakdown that the California Medical Association is looking after all the interests of its members, be they legal, legislative, educational, public relations or general. It is also obvious that some part of the strength of any large organization comes from its size and its ability to spread the cost of various programs among its members. Some of the results obtained by the various departments of the C.M.A. have cost only a few pennies per member but have bulked large in their benefits to the entire membership.

NEWS & NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Herbert M. Evans of Berkeley has been named as recipient of a 1954 *Modern Medicine* Award for Distinguished Achievement, Dr. Walter C. Alvarez of Minneapolis, editor-in-chief of the magazine, announced. Dr. Evans was given the award in recognition of his work in furthering of understanding of human reproduction, and of the physiology of the pituitary gland and his discovery of vitamin E.

The awards are given annually by *Modern Medicine* to recognize outstanding contributions to the advancement of medical practice.

* * *

A six-day graduate assembly for instruction and discussion of **The Dynamics of Endocrine Disease** will be held February 8-13 under the auspices of the Committee for Graduate Medical Education of the Alameda-Contra Costa Medical Association and the Institute for Metabolic Research of the Highland-Alameda County Hospital. The tuition fee is $100 and enrollment is limited to 100 persons.

FRESNO

Dr. C. S. Mitchell was elected president-elect of the Fresno County Medical Society at the annual meeting of the organization in December, and Dr. Fred E. Cooley was installed as president for 1954, succeeding Dr. William N. Knudsen. Dr. J. M. Arthur was elected vice-president and Dr. J. Cooper Collins secretary-treasurer. Drs. R. A. Donald, Byron Evans and Joseph A. Logan were elected to the board of governors for three-year terms.

Delegates to the California Medical Association's convention in May will be Drs. W. L. Argo, E. C. Halley and J. E. Young. Alternates are Drs. Bruce Berg, A. F. Howard, and J. F. Murray.

LOS ANGELES

A $24,105 **institutional research grant** to the University of Southern California School of Medicine by the American Cancer Society was announced late last month. The grant was given to help support a wide range of cancer research projects under the direction of the school's interdepartmental cancer research committee, representing all departments of the medical school, which is headed by Dr. Ian Macdonald, associate clinical professor of surgery at U.S.C. and chairman of the Cancer Commission of the California Medical Association.

NAPA

Dr. Harold E. James was elected president of the Napa County Medical Society at a recent meeting. He succeeds Dr. Fred Heegler. Dr. Herbert Messenger was elected vice-president, and Dr. Merle F. Godfrey was reelected secretary-treasurer.

SAN FRANCISCO

The first annual David W. Yandell medal was awarded by the Louisville Surgical Society to **Dr. Emile Holman,** professor of surgery at Stanford University School of Medicine, at a recent meeting in Louisville, Kentucky.

The annual award and lectureship were instituted to honor the memory of David W. Yandell, founder of the society, who was professor of surgery in the University of Louisville School of Medicine from 1869 to 1898.

Several surgical conferences were conducted at the University of Louisville by Dr. Holman preceding the presentation of the annual Yandell Lecture.

* * *

Dr. Windsor Cooper Cutting, who had been serving as acting dean of the Stanford University School of Medicine since July, recently was appointed dean. His permanent appointment by the University's Board of Trustees was announced by Wallace Sterling, president of the university.

At the same time it was announced that **Dr. Jay Ward Smith** had been named associate dean for professional services and that **Dr. George Bernard Robson** had been promoted from acting assistant dean to associate dean for academic affairs.

Dr. Cutting is the fourth dean of the Stanford Medical School. He succeeds Dr. Loren R. Chandler. After heading the school for 20 years, Dr. Chandler announced his resignation as dean in October 1952. He will continue as professor of surgery.

* * *

The San Francisco Chapter of the **Pan American Medical Association** held its annual dinner meeting honoring the local consular representatives and visiting Latin American physicians and students, at the Bohemian Club, December 5, 1953.

The newly elected officers for 1954 are: Dr. Marius A. Francoz, president; Dr. Ralph A. Reynolds, first vice-president; Dr. Berthel H. Henning, second vice-president; Dr. Leonard Barnard, treasurer, and Dr. Knox H. Finley, secretary.

GENERAL

Dr. James C. Malcolm, health officer of Alameda County, was elected president of the California Conference of Local Health Officers at a recent semi-annual meeting of the organization in Eureka. Dr. Harold Chope, director of public health and welfare of San Mateo County, was elected vice-president, and Dr. Edward Lee Russell, Orange County health officer, secretary.

* * *

The eleventh annual meeting of the **American Geriatrics Society** will be held in San Francisco, June 17-19, 1954, just preceding the meeting of the American Medical Association. The meeting will be open to all members of the American Geriatrics Society and to physicians and other scientists who are interested in the field of geriatrics. The program will cover many aspects of geriatric medicine, and there will be several panel discussions on such subjects as recent developments in cardiology and methods of determining operability in older patients. Oustanding clinicians and investigators will participate.

Dr. Laurance W. Kinsell, Oakland, is in charge of local arrangements for the meeting.

* * *

The **International Academy of Proctology** has announced its annual cash prize and certificate of merit award contest for 1953-54. The author of the best unpublished

contribution on proctology or allied subjects that is submitted will be awarded $100 and a certificate of merit. Certificates will be awarded also to physicians whose entries are deemed of unusual merit. This competition is open to all physicians in all countries, whether or not affiliated with the International Academy of Proctology.

The formal award of the first prize and a presentation of other certificates will be made at the annual convention dinner dance of the Academy in April 1954. Entries are limited to 5,000 words, must be typewritten in English, and submitted in five copies. They must be received no later than February 1, 1954. Entries should be addressed to the International Academy of Proctology, 43-55 Kissena Boulevard, Flushing, New York.

POSTGRADUATE EDUCATION NOTICES

RESEARCH STUDY CLUB OF LOS ANGELES

23rd Annual Clinical Convention of Ophthalmology and Otolaryngology

Date: January 18 through January 29, 1954. Each applicant must be a member in good standing of the American Medical Association in order to become eligible for attendance.

Fee: $100.00.

Contact: Pierre Violé, M.D., Treasurer, 1930 Wilshire Boulevard, Los Angeles 5, Calif.

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

General Surgery

Date: February 3 through April 7, 1954 (Wednesday evenings, 7:30-9:30)

Pathological Physiology

Date: February 15-May 3.

Dermatology in General Practice (limited to 20 students).

Date: February 17 to March 24.

Symposium on Anesthesiology

Date: May 13 and 14.

Electrocardiography

Date: June 2-18.

Courses for Laboratory Technicians: Hematology—February 15-May 24, V. A. Hospital, Long Beach; limit 20. **Laboratory Technicians Symposium**—June 19 and 20.

Contact: Thomas H. Sternberg, M.D., Head of Postgraduate Instruction, Medical Extension, University of California, Los Angeles 24.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Cardiovascular Diseases

Date: February 1 through 5, mornings at Medical Center. This course will cover the recent advances in the diagnosis and treatment of diseases of the cardiovascular system. While designed primarily for the internist, it will be of interest also to the general physician.

Electrocardiography

Date: February 1 through 5, afternoons at Medical Center. This course is designed to review the interpretation of electrocardiograms in all its aspects. Daily lecture periods will be followed by periods of practice, when the students will interpret electrocardiograms under the supervision of instructors. The class will be divided in groups based on previous experience.

NOTE: The two courses described above, *Cardiovascular Diseases* and *Electrocardiography*, are separate and physicians may take one without the other. It is suggested, however, that attendance at both courses will give a fuller and more rounded understanding of cardiovascular diseases.

Diagnostic Exfoliative Cytology for Physicians

Date: February 8 through 19 (tentative dates) all day, at Medical Center.

Symposium on Heart and Lung

Date: February 19, 20, 21 (week-end), University of California Extension Building, 540 Powell Street. This short course will give an intensive review of the most recent advances in the diagnosis and treatment of diseases of the heart and lung; with demonstrations and discussions.

Course for General Practitioners

Date: March 8 through 12, all day, Mount Zion Hospital, San Francisco. This program will be presented by the Visiting Staff of Mount Zion Hospital in collaboration with University of California Medical Extension. It will include many subjects of interest to the general physician, with demonstrations of patients and discussions of illustrative cases.

Symposium on Emergencies: Medical, Surgical, Obstetrical

Date: April 16, 17, 18 (week-end), University of California Extension Building, 540 Powell Street, San Francisco.

Course in Internal Medicine, American College of Physicians

Date: June 14 through 18, all day, University of California Extension Building, 540 Powell Street, San Francisco.

Conference on General Surgery

Date: September 13 through 17, all day, at Medical Center. This conference will be offered for the purpose of stressing the newer concepts, methods of diagnosis, treatment and techniques in surgery. Throughout the session emphasis will be placed on the diagnosis and treatment of malignant lesions. Instruction will consist of didactic periods, panel discussions, and actual operative demonstrations which will be televised from the operating room to the lecture hall. This program will be designed for general practitioners who are doing surgery. The class will be limited.

Conference on Fractures and Diseases of the Bone

Date: September 20 through 23, all day, San Francisco County Hospital. The program will cover the newer concepts, methods of diagnosis, treatment and techniques. There will be didactic lectures, panel discussions, and actual demonstrations of illustrative cases. The class will be limited.

Medicine for General Practitioners

Date: September 21 to December 7, Tuesday evenings, East Oakland Hospital, Oakland. This is a continuation course which is offered every year, with complete change of program and speakers. Class limited.

Evening Lectures in Medicine, Part 1 and Part 2

Date: September 16 through December 9, Thursday evenings, Mills Memorial Hospital, San Mateo. This is also a continuation course which will be of interest to both internists (Part 1) and to physicians in general practice (Part 2).

Symposium on Endocrine Diseases and Geriatrics

Date: October 22, 23, 24 (week-end), University of California Extension Building, 540 Powell Street, San Francisco. A review of recent developments in both fields, with suggestions for the management of patients past the age of fifty.

Microscopy (Part 1)

Date: January 14 through March 18, Thursday evenings, Medical Center.

Photomicrography (Part 2)

Date: April 1 through June 3, Thursday evenings, Medical Center. Part 2, Photomicrography, in monochrome and in color, cannot be taken without Part 1, but Part 1, Microscopy, which includes the critical use of the microscope, may be taken alone. These courses are open to any persons who are interested in the study of the topics listed above. Class limited.

Contact: Stacy R. Mettier, M.D., Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22, California.

COLLEGE OF MEDICAL EVANGELISTS

Otolaryngology (8 periods)

Date: February 9 through March 30, 1954, Tuesdays, 8:00-9:30 p.m. Tuition: $30.00. Dr. H. James Hara and Associates.

Varicose Veins (6 periods)

Date: March 2 through April 13, 1954. Tuesdays: 7:00-9:00 p.m. Tuition: $25.00. Carl H. Talmage, M.D., and Associates.

Histology and Histopathology of the Eye (15 periods)

Date: March 3 through June 9, 1954. Wednesdays: 7:30-9:30 p.m. Tuition: $60.00. I. G. Sommers, M.D.

Gynecology (10 periods)

Date: March 24 through May 26, 1954. Wednesdays: 8:00-9:00 a.m. Tuition: $30.00. Dell D. Haughey, M.D., and Associates.

Operative Surgery (12 periods)

Date: March 24 through June 9, 1954. Hunterian Laboratory and L.A.C.G.H. Wednesdays: 9:30 a.m.-12.00. Tuition: $200.00. Harry A. Davis, M.D.

Minor Orthopedic Surgery (8 periods)

Date: April 1 through May 20, 1954. Thursdays: 8:00-9:30 p.m. Tuition: $30.00. Alonzo J. Neufeld, M.D., and Associates.

Surgical Diseases of Children (4 periods)

Date: April 6 through April 27, 1954. Tuesdays: 11:00 a.m.-12 m. Tuition: $20.00. J. Norton Nichols, M.D.

Endocrinology (8 periods)

Date: April 6 through May 25, 1954. Tuesdays: 8:00-9:30 p.m., Los Angeles County Hospital. Tuition: $30.00. Julius Bauer, M.D.

Thoracic Surgery (8 periods)

Date: April 14 through June 2, 1954. Wednesdays: 8:00-9:30 p.m., Los Angeles County Hospital. Tuition: $30.00. Lyman A. Brewer, M.D.

Diseases and Injuries of Bones and Joints (4 weeks) Full time.

Date: July 5 through 30, 1954. Dr. Taylor's office and various hospitals. Tuition: $100.00. G. Mosser Taylor, M.D., Alonzo J. Neufeld, M.D., and Associates. Unless otherwise stated or arranged, courses will be held in Osler House, corner State and Michigan Avenues.

Contact: Chairman, Section on Graduate and Postgraduate Medical Education, College of Medical Evangelists, 312 North Boyle Avenue, Los Angeles 33, California.

STANFORD UNIVERSITY SCHOOL OF MEDICINE

Ophthalmology Conference

Date: March 22 through 26, 1954. Registration will be open to physicians who limit their practice to the treatment of diseases of the eye; or eye, ear, nose and throat. Registration limited to thirty physicians. Instructors will be A. Edward Maumenee, M.D., Dohrmann K. Pischel, M.D., Jerome W. Bettman, M.D., Max Fine, M.D., Earle H. McBain, M.D., and Arthur J. Jampolsky, M.D.

Clinical Ophthalmological Conference

Date: March 20, 1954, Saturday, 9:30-3:00, Stanford Lane Hospital, 2398 Sacramento Street, San Francisco, California. *No fee.*

Contact: Lowell Rantz, M.D., 2398 Sacramento Street, San Francisco, California.

C.M.A. REGIONAL MEDICAL AND SURGICAL INSTITUTES

North Coast Counties, Santa Rosa, February 11-12, 1954.

San Joaquin Valley Counties, Fresno, March 4-5, 1954.

West Coast Counties, Santa Barbara, March 18-19, 1954.

Sacramento Valley Counties, Sacramento, April 15-16, 1954. Please note change of date for Sacramento Valley Counties Institute, from April 1-2 to April 15-16, 1954.

Southern Counties, Palm Springs, April 22-23, 1954.

Contact: C. A. Broaddus, M.D., Director, Postgraduate Activities, California Medical Association, 1036 N. Center Street, Stockton, California.

SEMINARS OF THE ALUMNI COMMITTEE OF THE CHILDREN'S HOSPITAL, SAN FRANCISCO

January 23, 1954—The Problems of Prematurity and the Newborn Infant.

March 30, 1954—Acute and Chronic Infections and the Choice of Antibiotics in Treatment.

April 24, 1954—Childhood Ecology, with a discussion of physical, mental and emotional growth and development of the young child; the effects of deprivation of maternal care, and the impact of environment on the child.

A fee of $15.00 will be charged for attendance at all the seminars and those who wish to have further details or be on the mailing list for such details may write to: H. E. Thelander, M.D., Children's Hospital, 3700 California Street, San Francisco.

THE PHYSICIAN'S *Bookshelf*

ATOMIC MEDICINE. Edited by Charles F. Behrens, M.D., Rear Admiral, MC, U. S. Navy; formerly Director, Atomic Defense Division, Bureau of Medicine and Surgery, Navy Department. The Williams and Wilkins Company, Baltimore, 1953. 632 pages, $11.00.

This is probably the most complete single volume written on the subject of atomic medicine for information to all physicians and to everyone concerned with civilian defense. Since the first edition of this book, which appeared in 1949, there has been extensive revision of many of the chapters with the introduction of much new material. A new chapter has been provided on the administration and dosimetry of radioisotopes. Also because of the continued interest in the use of higher voltage acceleration there has been considerable information added regarding the medical aspects of this subject. The chapter on defense against atomic weapons has been entirely rewritten from a survival standpoint.

From the very beginning this book has included a great deal of information for all physicians who are interested in the many aspects of atomic warfare and atomic medicine and as to what can be done with regard to civil defense in the event of an atomic war. There are 22 chapters in this book and some of the chapters deal with the following subjects: Prevention and cure of radiation-caused damage to the human body; use of radioactivity as a medical tool; future possibilities for diagnosis and treatments; the role doctors may be called upon to fill in civil defense; dosimetry and administration of radioisotopes; and radioisotopes of medical interest other than radiophosphorus and radioiodine. These are but a few of the many interesting subjects dealt with in this book. This book should be in the library of every physician who wishes to keep abreast of the newer developments in atomic medicine.

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CHRONIC PULMONARY EMPHYSEMA—Physiopathology and Treatment. Maurice S. Segal, M.D., Clinical Professor of Medicine, Tufts Medical School; and M. J. Dulfano, M.D., Resident, Department of Inhalational Therapy, Boston City Hospital; Research Fellow in Medicine, Tufts College Medical School. Grune and Stratton, New York, 1953. 180 pages, $5.50.

This monograph is a welcome addition to the growing medical literature on pulmonary emphysema, and there is no comparable treatise available. The reader will be impressed with the variety of therapeutic measures which have proven to be valuable in treatment of this important disease. If the reader becomes confused, it is because this is a confusing disease and the selection of patients for application of the various procedures is not clear, because criteria for use of these measures are not well known.

Inhalation therapy is stressed more than would be approved by some experts in the field. The rationale and technique of such procedures as mechanical respiration, pneumoperitoneum, oxygen therapy, breathing exercises and the use of cortisone and corticotropin are adequately described. The important carbon dioxide intoxication syndrome is explained and properly stressed.

Most of the information is presented in brief form, but the bibliography of 176 references will lead the reader well into the complicated maze of more technical original studies.

Every physician who attempts to treat patients with pulmonary emphysema should consult this compact little volume of 180 pages.

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SURGICAL PATHOLOGY. Lauren V. Ackerman, M.D., Professor of Surgical Pathology and Pathology, Washington University, School of Medicine. C. V. Mosby Company, St. Louis, 1953. 836 pages, 913 illustrations, $14.50.

As the author has modestly indicated, this work is an introduction to the field of surgical pathology rather than a comprehensive reference text. Nevertheless, we should be grateful to Dr. Ackerman for one of the best books on surgical pathology published in the United States. The arrangement of the material, the references, and the terse, satisfactory presentations are excellent.

It is gratifying to note that the instructions for examining the stomach, colon and breast are found in introduction of the related chapters.

The subject of exfoliative cytology is cleverly interpolated in the systems involved. Exfoliative cytology thus becomes an adjunct to histopathological diagnosis rather than a separate science. Certainly the student of pathology should have no difficulty in properly evaluating this essential tool of the histopathologist.

Unfortunately for the surgical pathologist in California, the author has not included information about coccidioidomycosis, since we see more surgical specimens of this disease than postmortem material. A second edition should have such information.

The illustrations are well chosen and unusually good. This book is highly recommended for the medical student, the resident and the practicing pathologist.

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THE SURGERY OF INFANCY AND CHILDHOOD—Its Principles and Techniques. Robert E. Gross, M.D., D.Sc., William E. Ladd Professor of Children's Surgery, Harvard Medical School, W. B. Saunders Company, Philadelphia, 1953. 1000 pages, 1488 illustrations on 567 figures, $16.00.

This is a book which is a masterpiece in its field and is unrivaled in its scope, content, clarity of expression and manner of presentation. It represents the culmination of a rich experience in a rapidly expanding field of surgery by one who has been foremost in personally enriching the field. All aspects of pediatric surgery are covered; the conclusions based upon the results of large groups of cases which have been carefully followed are given, and the author's preference for treatment is clearly indicated in each disorder. The illustrations are excellent. The book is destined to be a classic in its field for years to come. It is wholeheartedly recommended to anyone interested in any aspect of pediatric surgery.

CLINICAL DIAGNOSIS BY LABORATORY METHODS —A Working Manual of Clinical Pathology—12th Edition. James Campbell Todd, Ph.B., M.D., late Professor of Clinical Pathology, University of Colorado School of Medicine; Arthur Hawley Sanford, A.M., M.D., Emeritus Professor of Clinical Pathology, Mayo Foundation, University of Minnesota; and Benjamin B. Wells, M.D., Ph.D., Professor of Medicine, Department of Medicine, School of Medicine, University of Arkansas. W. B. Saunders Company, Philadelphia, 1953. 998 pages, 946 illustrations on 403 figures, $8.50.

The twelfth edition of this time-tested standard manual of clinical pathology contains comparatively little revision. Most of the changes have been made to bring various aspects of laboratory diagnosis into conformity with authoritative texts on particular subjects.

The reviewer believes that a text of this caliber should be more inclusive in its overall viewpoint and more complete in its scope. Although the authors may feel that detailed descriptions of all the tests on a subject cannot be given—for the argument, take the tests for liver function—mention of them might well be included so that the student could look further on his own. In the discussion of the biologic skin tests there is no mention of that for cat scratch fever, a disease which has provoked considerable interest during the past few years. The Table of Normal Values on pages 934 and 935 could be greatly expanded: There could be included also a brief discussion for the significance of some of the abnormal values.

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OPHTHALMOLOGIC DIAGNOSIS. F. Herbert Haessler, M.D., Professor and Director of the Division of Ophthalmology, Marquette University School of Medicine. The Williams and Wilkins Company, Baltimore, 1953. 387 pages, $8.00.

The book has nine chapters and 387 pages. The book is written for ophthalmological students. It is a practical office or bedside approach to ophthalmological problems. It puts emphasis on the patient as a human being and the handling of the patient as well as diseases of the eye.

Very little bibliography is used; rather, it is the writer's approach to these various problems.

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BRAIN SURGEON — The Autobiography of William Sharpe. William Sharpe, M.D., Director of Neurosurgery, Manhattan General Hospital, New York. Viking Press, Inc., 18 East 48th Street, New York, 1952. 271 pages, $3.75.

As the title of this book strongly suggests, it is not written primarily for the specialist in surgical diseases of the nervous system — who shuns such a sobriquet — but rather is directed to the general reader who for one reason or another is interested in biography or medicine or doctors or neurological surgery. Physicians who help constitute this group, however, will find much of this autobiography to be interesting. The sections in which Dr. Sharpe recounts his concept of his own contribution in the early development of neurological surgery, such as in "Cerebral Palsy," are of some historical import. Most readers, however, will find it to be an interesting series of personal yarns by a pioneer in a special field, which to many has seemed consistently to have excited more than its fair share of romantic appeal in the average person.

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PITUITARY CHROMOPHOBE ADENOMAS—Neurology, Metabolism, Therapy. John I. Nurnberger, M.D., Research Associate, the Institute of Living, and Assistant Clinical Professor of Medicine (Neurology), Yale University School of Medicine; and Saul R. Korey, M.D., Associate Professor of Neurology, the School of Medicine, Western Reserve University. Springer Publishing Company, Inc., 44 East 23rd Street, New York 10, 1953. 282 pages, $7.00.

The limited field covered by this book is commented on by the authors in their preface; that almost 250 pages of text can be profitably devoted to the subject is open to question. Nonetheless, the authors have done a very good job of covering their subject, from the embryology of the pituitary to the treatment of its tumors. Whether any but the neurologist and endocrinologist will want to devote the time to reading the whole book is open to question, but it does provide an exhaustive reference work and should be useful in this regard.

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HANDBOOK OF DIFFERENTIAL DIAGNOSIS. Harold Thomas Hyman, M.D. J. B. Lippincott Company, Philadelphia, 1953. 716 pages, $6.75.

In this compressed, well systematized volume, the author attempts to give the practicing physician and student an aid to differential diagnosis. He also endows it liberally with the personality of Dr. Hyman.

Unfortunately, the book falls short of being the "volume of small bulk and large value in daily clinical practice" which he would have it, although it appears accurate enough. An example of the type of procedure one must go through may be illustrated by the search necessary to find the discussion of pain in the leg on walking. Employing the index of symptoms and signs (printed in blue paper), one looks for "Pain" on page xxiv and is referred to "Anatomic Site." Under "Legs" on page xx, one is referred to page 374, which is "Lower Extremities, Disturbances of." Here one is referred to "Pain of Lower Extremities," page 315—where one finds the headline "Hands and Feet, Fingers and Toes, Pain in and Tenderness of." After reading through a page and a half, one gets to tenosynovitis which is a condition he might be seeking. If this seems a little disturbing, one can always go back to an ordinary textbook.

The common symptoms of fatigue or tiredness are not listed as such but are hidden under the name of asthenia. On the other hand, it is easy to find a good deal of therapeutic and diagnostic advice which one may not desire.